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ABSTRACT

The primary purpose of this project is to develop and field test a core curriculum in agriculture for rural secondary schools and a core curriculum in agriculture for metropolitan or urban schools in Illinois. Activities of Phase 1 of the project were reviewing literature and interviewing industry representatives to identify pertinent research and gather employment information, organizing and meeting with a rural agriculture program advisory committee and a metropolitan agriculture program advisory committee, conducting observational trips to five states, developing a collection of core curriculum resources from other states, and surveying Illinois teachers to determine content for the core curriculum. In addition, an assessment of employment needs for Illinois agriculture was made. As a result of this assessment, employment trends within the framework of the seven taxonomic areas of agricultural education (agricultural production, agricultural supplies and services, agricultural mechanics, agricultural products, ornamental horticulture, renewable natural resources, and forestry) were identified. Based on project findings, common competencies that are needed by those planning to enter occupations in Illinois agriculture at entry or mid-management levels were identified. (LRA)

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CORE CURRICULUM IN AGRICULTURE

PHASE I REPORT

Department of Adult, Vocational and Technical Education
Illinois State Board of Education
Springfield, Illinois
July, 1980

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EDUCATION & WELFARE
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PROJECT SUMMARY

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Location: Urbana, Illinois 61801

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RURAL AGRICULTURE PROGRAM ADVISORY COMMITTEE

1. High School Agricultural Occupations Teachers

District One - Russell Leman
Roanoke-Benson High School

District Two - Richard Dunn
Seneca High School

District Three - Charles Ferguson
Pittsfield High School

District Four - Allen Hornbrook
Paris High School

District Five - Larry Keyser
Clay City High School

Statewide - Robin Shirley
Tri-Valley High School

2. Area Vocational Center Representative

Donald Kaufmann
Grundy County Area Vocational Center

3. Community College Representative

William Martinie
Illinois Central College

4. Agricultural Business/Industry Representatives

   a. Agricultural Service and Supply
   Louis Wagner, Sommer Bros. Seed Co.

   b. Agricultural Mechanics
   Roger Neitfeld
   Pfister Implement Co.

   c. Horticulture
   Frank Louis Selmi

5. Governmental Agency Representative

Ray Lett, Assistant Director
Illinois Department of Agriculture

METROPOLITAN AGRICULTURE PROGRAM ADVISORY COMMITTEE

1. High School Teachers

Emiel Hamberlin
Dusable High School

Carl Reed
Barrington High School

Louis Schairer
District 214

Pamela Wolf
Willowbrook High School

2. Area Vocational Center Representative

James Phelps
Wilco Area Vocational Center

3. Community College Representative

Marcia Eberwine
Joliet Junior College

4. Business and Professional Representatives

Paul J. Chase
Chicago Board of Education

Kenneth D. Gallt
D. R. Church Landscape Co., Inc.

James Hayward
Illinois State Nurserymen's Association

Peter Orom
Midwest Ground Covers

George Schuman, Jr.
Stonegate Farm Nursery & Landscaping, Inc.

Ralph Synnestvedt, Jr.
Synnestvedt Landscape Company

ABSTRACT

Objectives of the Project:

1. To review existing Employment studies and competency studies to determine Employment needs in agriculture and identify competencies common to most agricultural taxonomy areas.
2. To collect and analyze agriculture courses of study and curriculum materials currently used in Illinois secondary schools.
3. To observe core curriculum programs in operation in other states.
4. To survey Illinois teachers regarding suggested content for the core curriculum.
5. To develop a tentative outline of a core curriculum at the ninth grade level and two prototype instructional packets.
6. To conduct an informational meeting and teacher workshop for potential field test teachers.

Procedures of Implementation:

1. Review literature and interview industry representatives to identify pertinent research and gather Employment information.
2. Organize and meet with a Rural Agriculture Program (RAP) Advisory Committee and a Metropolitan Agriculture Program (MAP) Advisory Committee.
3. Involve project staff and advisory committee members in observational trips to five states.
4. Develop a collection of core curriculum resources from other states.
5. Administer questionnaires to Illinois teachers to collect data on what should be included in the core curriculum.
6. Prepare two instructional packets.
7. Develop outline for first year of RAP and MAP core.
8. Conduct workshop for field test teachers.

Contribution to Vocational and Technical Education:

This project has the potential for redefining and redirecting agricultural occupations programs in Illinois. The products to be produced

will enable teachers to become more effective and efficient in delivering instruction in agriculture. Students will benefit from improved instruction and better learning opportunities.

INTRODUCTION

The primary purpose of this project is to develop and field test a core curriculum in agriculture for rural secondary schools and a core curriculum in agriculture for metropolitan or urban schools in Illinois. Instructional packets for the rural agriculture program (RAP) and the metropolitan agriculture program (MAP) are to be developed and made available to teachers during the three-year period, 1980-83. Program planning guides, one for rural agriculture programs and one for metropolitan programs are to be developed to assist teachers and administrators in reorganizing their agricultural occupations programs and installing the core curriculum in their schools.

A growing concern for agricultural occupations programs in Illinois high schools has prompted the development of this core curriculum research and development project. The problems of teacher shortage, low staff morale, high teacher turnover, and the closing of some agriculture departments are thought to be associated with the curriculum problems which this project will address. Many teachers, teacher educators and state consultants agree that a core curriculum is needed along with instructional materials required to teach the core units.

The major activities planned for this long-term project are as follows:

1. Redefine the objective of agricultural occupations programs in Illinois.
2. Develop recommended program models for rural and urban schools.
3. Review research on employment needs and competency identification in Illinois and other states.
4. Study core curriculum programs in other states and review core curriculum materials from other states.

5. Organize a RAP Advisory Committee and a MAP Advisory Committee composed of industry representatives, teachers and others to advise the staff and make recommendations on project activities.
6. Conduct teacher surveys to determine the agriculture units currently taught in Illinois high schools and to solicit opinions regarding what should be included in the two core curricula.
7. Prepare instructional packets for each unit to be included in the core curricula.
8. Field test instructional packets in 20 high schools.
9. Revise and publish instructional packets for the rural agriculture program and the metropolitan agriculture program.

The impact of this project on vocational education programs in Illinois will be determined in part by the procedures followed in the development and preparation of the core programs. In order to maximize the adoption rate of the core curriculum by Illinois teachers the following approaches will be utilized:

1. Involve teachers on both the RAP and MAP Advisory Committees.
2. Use 20 teachers to field test materials.
3. Conduct surveys to solicit opinions of teachers regarding what should be taught in the core curriculum.
4. Keep teachers informed of project activities using Vo. Ag. Aides, news releases and reports at teacher conferences.
5. Involve teacher educators from Illinois State University, Southern Illinois University, and Western Illinois University in project activities.
6. Incorporate core curriculum concepts into the beginning teacher's course (Votec 370 taught at the University of Illinois) and undergraduate programs at the three universities.
7. Conduct workshops for teachers to provide instruction on how to use the core curriculum materials.
8. Make instructional packets available to teachers through Vocational Agriculture Service at the University of Illinois.

9. Coordinate project activities with the program of the Illinois Joint Staff in Agricultural Education.
10. Involve staff members in Vocational Agriculture Service and the Division of Agricultural Education in the project.

These approaches along with the production of high quality products should help improve the adoption rate and increase the impact of the project on vocational programs.

Phase I of the project began February 1, 1980 and ended June 30, 1980. This report covers the project activities during this five-months period.

STAFF DEVELOPMENT ACTIVITIES

An important part of Phase I of this project was the development of project staff. In order to involve and effectively utilize project staff from the College of Education and the College of Agriculture, agricultural occupations teachers and advisory committee members in this project, several staff development activities were undertaken. These activities were seen as important and necessary in the clarification of the core concept and project activities and in the coordination of work of various subgroups and individuals. Activities which helped promote staff development were as follows:

1. Staff meetings conducted once every two weeks.
2. Meetings of RAP and MAP Advisory Committees (two all-day meetings of each committee).
3. Discussions held with presidents of Illinois Association of Vocational Agriculture Teachers and Illinois Association of Community College Agricultural Instructors regarding the purpose and nature of the project.
4. Monthly reports to Illinois Joint Staff.
5. Team visitations to five states to learn how the core curriculum program had been developed and implemented.

6. Review of resource materials from other states.
7. Teacher workshop to orient field test teachers to the core project and develop plans for using the instructional packets in 1980-81.

These activities were seen as staff development activities and also as a way of achieving statewide support and cooperation for the core curriculum program.

REPORT OF VISIT TO INDIANA

A team of four persons, including Paul Hemp, Project Co-director; Leon Mayer, Rural Agriculture Program Leader; Allen Hornbrook, Agriculture Teacher and Vocational Director at Paris High School and a member of the Rural Agriculture Program Advisory Committee; and John Fedderson, Associate Executive Secretary of the Illinois Association of Vocational Agriculture Teachers, visited the following locations and met with the following people in Indiana on March 19, and 20, 1980:

1. Lafayette, Indiana, at 9:00 a.m., on March 19. The team met with staff from the Indiana State Board of Vocational Education as follows:
    a) Edgar E. Hornback, State Coordinator of Supportive Services and Program Improvement.
    b) Dewey Stewart, Chief Consultant in Agricultureal Education.
    c) Ed Brown, Consultant in Agricultural Education-Curriculum Development.
    d) Gary Gesivein, Consultant in Agricultural Education.
2. Southmont High School at New Market, Indiana, at 1:00 p.m. on March 19. The team met with agriculture teachers in a two-teacher department as follows:

   a) Gary Mosbaugh
   b) Richard McGown

3. Eastern High School at Greentown, Indiana, at 10:00 a.m. on March 20. The team met with Larry Talbert, Agriculture Teacher.

4. Agricultural Education Staff of Purdue University in West Lafayette, Indiana, at 1:30 p.m., on March 10. The team met with William Richardson, Chairman of the Agricultural Education Division in the Department of Education.

The visitation team made the following observations during the Indiana visit:

1. Indiana embarked on a core curriculum program in agriculture in 1970. The program, in this initial phase, consisted of two core courses; Agri-Business Core I, for offering at the 9th grade level; and Agri-Business Core II, for offering at the 10th grade level. This initial core program consisted of a standardized course outline developed at Purdue University through a state grant, utilizing a committee including high school agriculture teachers, State agricultural occupations consultants, and Purdue University Agricultural Education staff. This committee studied core curriculum programs in other states and considered needs for agricultural occupations programs in Indiana, and then used their best judgment to plan the core program. This initial core program was used for about three years.

2. During the second stage of the core curriculum development work in Indiana, lasting about three years, the State Department of Education bought and distributed core curriculum materials from the Oklahoma core curriculum program.
3. During the third stage of development, through a second state-funded project, Purdue University organized another committee consisting of high school agriculture teachers, State agricultural occupations consultants, and Purdue University Agricultural Education staff, which worked intensively during one summer to up-date the original Indiana core curriculum. Core curriculum course outlines and teaching materials were developed for the Core I and Core II courses, using some materials from Oklahoma, Missouri, and Illinois.

   The revised Core I and Core II materials were field-tested in Indiana high schools, and these materials were revised in accordance with recommendations from the field test schools.

   Intensive in-service education programs were conducted for teachers interested in implementing the core curriculum program. Participating teachers who had completed the in-service education received a free set of core curriculum materials.
4. The state of Indiana is currently involved in a fourth phase of development of core curriculum programs ina griculture. This phase is directed to the development of specialized occupational preparation programs for the 11th and 12th grades of high school agriculture programs. The approach

being used is to extend the Indiana performance-based vocational education system to agricultural occupations. This system is job-placement oriented, and relies as a source of course content, exclusively upon a job, job cluster, and occupational cluster task analysis. The system or process, results in an occupational cluster core, a program core, a curricula core, and a course core, with tasks and learning content identified as common to each core.

5. The State of Indiana has apparently achieved a statewide consolidation of small high schools into comprehensive county high schools, with one or two per county in rural areas. The State of Indiana has developed area vocational schools in some counties, but not many of these area schools have included specialized agricultural occupations programs. Indiana does not have a system of public community colleges, since post-secondary education is organized through branch two-year campuses of Purdue University and Indiana University. These branch campuses do not offer post-secondary programs in agriculture. The only post-secondary program in agriculture in Indiana is an associate degree program in agriculture offered at the Purdue University campus in West Lafayette.

6. The rural high school programs of agricultural occupations in Indiana are essentially production-oriented. Very little is being done to provide specific job training for the non-farm agricultural occupations, including the broad area of agricultural supply and service. Not many local high schools have

developed cooperative education programs for agricultural occupations students; however, both the high school teachers interviewed, and the university agricultural education staff interviewed, agreed that the cooperative education mechanism would be a good means for providing job training for the non-farm agricultural occupations, particularly in single teacher department.

7. All of the Indiana high school agriculture teachers are on an extended year or 12 month teaching contract.
8. The high school teachers and the university agricultural education staff interviewed felt that the Indiana performance-based vocational education system was too narrowly conceived to have practical application to agricultural occupations, because of the fact that agricultural occupations may be different than some of the other occupational areas to which this system is being applied. These people felt that the Indiana agricultural occupations programs were not single-purpose, job-placement oriented programs, but instead were multi-purpose programs, providing career orientation, vocational exploration, leadership and citizenship development, and general education in basic agricultural knowledge and skills. The teachers interviewed felt that the core curriculum was especially useful for beginning teachers, but felt that the curriculum was only a guide, and needed substantial adapting and supplementing to meet the needs of the local school. Indiana high schools include semester length agriculture

courses in their programs, but report that supervised occupational experience programs and membership in the Future Farmers of America are optional; therefore, the schools visited did not have 100% of their students involved in S.O.E.P., and only about 2/3 in the F.F.A.

REPORT OF VISIT TO OKLAHOMA

A team of four persons including Paul Hemp, Project Co-director; Leon Mayer, Rural Agriculture Program Leader; Charles Ferguson, Agriculture Teacher at Pittsfield High School and a member of the Rural Agriculture Program Advisory Committee; and John Fedderson, Associate Executive Secretary for Illinois Association of Vocational Agriculture Teachers visited the following locations and met with the following people in Oklahoma on March 26, 27 and 28:

1. Mannford High School, at 1:00 p.m., on March 26. The team met with Delbert Lantz, agriculture teacher in a single-teacher department, Greg Pierce, Agriculture Curriculum Coordinator for the Oklahoma State Vocational Curriculum and Instructional Materials Center, two Oklahoma State University agriculture student teachers, and the principal of Mannford High School.
2. Oklahoma Vocational Curriculum and Instructional Materials Center at Stillwater, Oklahoma, at 8:30 a.m., on March 27th. The team met with Greg Pierce, Agriculture Curriculum Coordinator, and other support staff from the Center.
3. Oklahoma Vocational Curriculum and Instructional Materials Center Print Shop and Warehouse at Stillwater, Oklahoma, at 1:30 p.m., on March 27th.

4. Oklahoma State University Agricultural Education staff at Stillwater, Oklahoma, at 3:00 p.m., on March 27th. The team met with Robert Terry, Chairman of the Department, Robert Price, Professor Emeritus; James Key and James White of the Agricultural Education staff.

5. State Supervisory Personnel for Vocational Agriculture, at Oklahoma State Department of Vocational Education, at Stillwater, Oklahoma, at 8:30 a.m., on March 28th. The team met with the following persons:
    - a) Ralph Dreesen, Chief State Supervisor
    - b) Joe Raunikar, Assistant State Supervisor
    - c) Raymond Cockrum, District Supervisor
    - d) Harold Troutman, District Supervisor
    - e) Eddie Smith, District Supervisor
    - f) Bob Mitchell, District Supervisor
    - g) Verlin Hart, District Supervisor
    - h) Larry Shell, F.F.A. Executive Secretary
    - i) State Director and Assistant Director of Vocational Education

6. Yale High School, at Yale, Oklahoma, at 12:30 p.m. on March 28th. The team met with agriculture teachers Ferlan Dean and Steve Smith, student teachers Richard Gibson and John Horne; and James Key, Professor of Agricultural Education from Oklahoma State University.

The visitation team made the following observations on the Oklahoma visit:

1. The development of a core curriculum in agriculture for Oklahoma high schools began during the summer of 1968, from an expressed need by teachers, state supervisory staff, and university agricultural educators for help to teachers in determining what to teach, for curriculum materials to carry out the instruction, and as a means to somewhat standardize about 60% of the content of programs.

   A committee of 25 high school teachers, state supervisory staff, university agricultural educators, and agri-business representatives worked intensively during the summer of 1968 to identify through occupational analysis, the experience of other states including Texas and Missouri, and their own Oklahoma experience, the content to be included in a four-year core curriculum in production agriculture for Oklahoma.

   A format for a teacher's guide, and for student materials was developed and accepted. Curriculum writers from the State Department of Education, the Oklahoma State University staff, high school agriculture teachers, and agri-business, were then employed to develop these teachers' guides and student curriculum materials. The materials developed by these writers were validated by the initial advisory committee, subjected to systematic editing, and then mass-produced. The materials were introduced into agricultural education methods classes and student teaching at Oklahoma State University. Intensive in-service education workshops were conducted annually on how to use the core curriculum materials. Core courses are named Agriculture I, II, III, and IV, and are year-long courses.

2. A major revision of the Agriculture III core curriculum course was completed during the summer of 1977, using essentially the same procedure that was used originally.
3. Using the same process, a curriculum and curriculum materials have been developed for specialized occupational preparation programs consisting of two year-long courses at the 11th and 12th grades, in agricultural mechanics, horticulture; agricultural supply, sales, and service; and other agricultural specialities. These specialized programs are offered in multiple-teacher department; and in only a few cases, horticulture is offered in selected area vocational centers.
4. Agricultural occupational education programs in Oklahoma high schools are essentially production-agriculture oriented, with strong supervised occupational experience programs, and essentially 100% membership and participation in the Future Farmers of America. The programs appeared to be, for the most part, general in nature, providing a broad background of basic agricultural knowledge and skills, and leadership training. There was good evidence that students were getting many "hands on" practical agriculture experiences.
5. Oklahoma high schools were not using cooperative education to any great extent, as a means for providing job training for the non-farm agricultural occupations; however, teachers, state supervisors, and teacher educators agreed that they

would like to develop cooperative education programs for the agricultural occupations, but felt that this would only be possible in a single-teacher department if the four core courses offerings could be streamlined by combining the Agriculture III and IV courses for offering on alternate years, allowing the teacher to utilize the time saved to offer a cooperative education program.

6. The state program approval, reimbursement, and supervisory function in Oklahoma is strong, with the following policies and procedures which help to facilitate strong high school programs in agriculture:
    a) Teachers are required to be on a 12 month teaching contract.
    b) A single teacher may teach no more than 60 students in no more than four courses.
    c) The agriculture teacher's teaching duties must end at 2:30 p.m. with the last period of the day free for visitation and supervision.
    d) Supervised occupational experience and the Future Farmers of America are required, with quarterly and annual reports to verify compliance.
    e) State supervisors make periodic visits to local high school agriculture program.
7. The Oklahoma core curriculum materials were essentially subject-centered, rather than student-centered, and appear to encourage and facilitate a cognitive, recitation-type of classroom learning. Teachers and agricultural education staff

were especially aware of this problem. State supevisory staff and the Agriculture Curriculum Coordinator in the State Department of Vocational Education were also aware of this problem, and explained that the core curriculum is intended to be used only as a core, representing approximately 60 percent of the content for a local school program; therefore, the core curriculum is intended to be localized, supplemented, personalized, and the local teacher is expected to work out motivational techniques. The University Agricultural Education staff is expected to provide pre-service and in-service education for teachers on how to localize, supplement, personalize and motivate. Beginning teachers tend to lean too heavily on the core curriculum materials.

8. The Oklahoma core curriculum materials are intended to be competency-based and some of the materials in the specialized occupational preparation programs could be adapted for individualized instruction, but to date not much has been done to individualize instruction.

The standard components of the Oklahoma core curriculum materials are as follows:

a) Performance objectives
b) Suggested teaching activities
c) An information sheet
d) Transparency master copies
e) Assigment sheets (with answers)
f) Job skill sheets

g) A criterion referenced test (with answers)

Materials adapted for individualized instruction would include addtional reference materials and audio-visual materials, and would have special application in the job-related class and in the on-the-job training for cooperative education programs.

9. Some of the Oklahoma core curriculum materials are being used in other states, individually and through a consortium approach. Some of these materials could be adapted for use in Illinois.

10. The Oklahoma core curriculum is used as one of the minimum standards for local agriculture program approval.

REPORT OF VISITS TO METROPOLITAN AGRICULTURE PROGRAMS

I. Schedule of Visitation

March 24 8:00 PM - Left Chicago

10:09 PM - Arrived Cleveland

March 25 7:00 AM - We met for breakfast with Dr. J. Knight, Ohio State University, Agricultural Education Department, and Dr. Peter Wotowiec, Supervisor of Horticultural Education, Cleveland, Ohio Public Schools. Discussion centered upon the comparison of vocational education programs in Illinois and Ohio. We emphasized how we intended to use the observations and information upon our return to the Chicago area. A general background and history of vocational education, specifically in horticulture and agricultural education, was explained by our hosts.

8:30 AM - We arrived at West Tech High and met with the teachers, Messrs. George Arley and Phil Crank. We toured the facility and immediately noticed the original greenhouse was a very high roofed conservatory with heating pipes and radiators placed high in the building. The structure was poorly heated and the temperature upon our arrival was 52°. The enrollment of horticulture students totaled 60, and students could elect to enroll in horticulture for three years.

The introductory class met for two hours each day and studied general horticulture topics and were introduced to basic horticultural skills. The students enrolled in Horticulture II and III attended classes for four hours each day. The attendance in horticulture class as explained by the teaches was very poor, with 20% to 50% or more absenteeism each day. This probably reflected the effect of a seven-month teacher strike. Many students still had part-time jobs which may have accounted for the student absenteeism.

10:00 AM - We arrived at Martin L. King High School, characterized by a greenhouse, 40' x 100', on the roof of the main high school building. We met Mr. Joe Bairly, the horticulture instructor and Mr. Okai, the "lab" assistant. The greenhouse was being utilized extensively by a large number of bedding plants and vegetable seedlings being grown for the forthcoming spring sale. The program was somewhat hindered because students had recently been shifted from school to school since the city and schools are in the midst of a desegregation procedure. The instructor noted that his present class had only met with him for three class sessions; therefore, it was difficult to judge how much of the growing and work evident in the greenhouse had been done by the students. The greenhouse floor was wet and slippery and water had been standing on it for a long time. The location of the greenhouse on the roof created a nearly impossible situation for replacing broken panes of glass caused by winds and vandalism. General maintenance of the structure was also difficult to accomplish due to this placement on the roof.

1:00 PM - We arrived at South High School and met Mr. Jack Newmarch, the horticulture instructor. The greenhouse, 12' x 40', was placed on the roof of the building. Security dictated the building be locked completely during the weekends; therefore, the importance of a reliable automatic watering system was discussed. The classroom was large and included several plant stands with artificial lighting. The instructor utilized his past experiences as a floral designer and taught a large amount of floriculture in his classes. This facility included a large store room, "head house," and an outdoor rooftop garden, 60" x 60", which had not been completed.

2:15 PM - Washington Park Horticulture Center. This center was composed of several buildings which housed instructional facilities for ornamental horticulture, horticulture mechanics, small animal care and environmental management. Considerable time was taken to touring each building. The small animal care laboratory included a classroom with aquaria and small animal cages for holding fish, birds, snakes, amphibians, gerbils, rats, and mice. We also observed a small room being used for trimming and grooming dogs. Of special interest was an operating room which was utilized by visiting veterinarians when operating upon these same small animals. The students were trained to assist the veterinarians during the operating procedure. A large amount of space was taken by small cages holding small laboratory animals. Much time was spent discussing vocational education in Ohio. Apparently each school is reimbursed $18,000 to $19,000 for each vocational agriculture teacher or vocational horticulture teacher employed. Cleveland has had a long history of vocational horticulture programs beginning in 1896 when garden clubs organized informal gardening programs for children. The standard tract garden program format was established in 1932 and became a program model throughout the U.S. In 1962, a pilot vocational horticulture program was established at West Tech and served as a model for programs in the U.S. since 1963. We were given fact sheets enumerating agriculturally related businesses in metropolitan Cleveland which numbered 3,200 total businesses of which 2,000 are horticulture.

6:46 PM - Left Cleveland Airport

7:55 PM - Arrived Philadelphia

March 26 7:00 AM - We met for breakfast with Principal Ralph E. Bartholomew and Mr. Bob Holley of Walter Biddle Saul High School, an agriculture school in the city of Philadelphia. We discussed how a feasibility study was used prior to the formation of the agriculture school. This school accepts applicants from 80 high schools in the metropolitan area of Philadelphia. Total enrollment in the school is 676. There are six applicants each year for every student accepted for enrollment. Students take public transportation to and from the school and some travel 20 to 25 miles and spend 1 to 1½ hours of travel time to and from the school. The school originated in 1966 and was enlarged to its present size in 1973. The students enrolled in this school major in agriculture and study all the other necessary academic subjects to prepare them for agriculture colleges. The ninth-and tenth-grade programs furnish a basic introduction to many agricultural occupations by using classroom laboratories, shops, and land laboratories as a means of understanding fundamental agricultural processes. In the eleventh and twelfth grades students select one of seven agricultural areas in preparation for an occupation or for admission to college. Students have the opportunity to enter cooperative-work experience programs in an area of agricultural specialization. Specific areas include: Agricultural Resources Management, Animal Production, Laboratory Animal Technology, Turf Technology, Retail Floriculture, Agricultural Sales and Service, Crop Production, Agricultural Products, Greenhouse Management, and Landscape Horticulture.

9:00 AM - We arrived at W.B. Saul High School and met with a group of staff members and Mr. Phillip Stahl, a Philadelphia Board of Education member and lawyer. Comments and discussion revolved around desegregation, quality of education, feasibilty of teaching agriculture to metropolitan students, supervised occupation programs, the problems associated with teaching agriculture in a metropolitan area, and many other topics.

We then toured the facility which included a dairy farm with 20 head of registered Holstein dairy cows. The herd's production is recorded in the D.H.I.A. Their facilities included a meat lab, golf course, equipment shed, kennel, poultry house and a complete educational building, housing all the classrooms and a greenhouse. It appears to be a complete facility for teaching agriculture in the city.

3:00 PM - Left Philadelphia

4:00 PM - Arrived Kennedy Airport

March 27 7:00 AM - We met with Mr. William Wochler, horticulture teacher and team leader of Nassau B.O.C.E.S. school on the Westbury Campus, Westbury, N.Y.

8:00 AM - We arrived at Westbury B.O.C.E.S. school and toured the small greenhouses. These greenhouses were utilized to grow a variety of plant material from specimen plants to bedding plants for spring plant sale. This program is housed within a converted estate and included an extensive facility for large animals (horses), both thoroughbred and trotters. The students were bussed from the local center to Westbury campus each day for 2½ hours of instruction. The horse husbandry program is intended to train the students as grooms. They are graded on skills including harnessing the horse, bandaging the legs, warming down the animal, exercising the thoroughbred or trotter and cleaning the stall. Students are active participants and they are enthusiastic about the program. Most looked forward to being employed at the local racetracks this season. We also visited the area vocational center where floral design, small animal care, and many other vocational subjects were being taught. Teachers expressed concern about decreasing enrollment in various programs and discussion centered upon various methods utilized to increase "visibility" of vocational programs to the prospective students.

1:00 PM - John Bowne High School, Flushing, N.Y.--We met Mr. Robert Klastorin, agriculture instructor and assistant principal and Dr. Parsteck, acting principal. They informed us that a total of 400 students are enrolled in agriculture which represents 10% - 12% of the total high school enrollment. Agriculture offerings include: Exploratory Agriculture - a one year course for boys and girls from all boroughs of New York City; Technical Agriculture - a three-year course exploring all areas of agriculture from food production through soil conservation and animal care; Ornamental Horticulture - a three-year program terminating with placement on the job and supervision by the horticulture teacher; Small Animal Care - a three-year program designed to survey vocational and professional job opportunities in animal care. We toured the facility which included a four bay laboratory, greenhouse, poultry house, and a two-acre orchard. An interesting requirement of this program was three summers of planned agricultural experiences to be completed by every student.

6:55 PM - Left New York/Kennedy Airport

8:26 PM - Arrived Chicago

II. General Observations and Reactions of Team Leader.

A) Cleveland, Ohio

Racial turmoil and a teacher strike have hindered the Cleveland program. A strong history of organized tract gardening has proved successful in the city. The greenhouse located on the roof of a building is not a desirable facility. The horticulture program appeared to be organized and the greenhouses were clean. Too many fish tanks and expensive equipment were used within the small animal care facility. Food products facility seemed to be well organized but I didn't see the students doing anything except taking notes from a book. There seemed to be an emphasis on academics. I didn't notice a very active FFA chapter.

B) Philadelphia, Pennsylvania

I was favorably impressed by the facility and program at W.B. Saul High School. Students were active and involved in class activities. The dairy barn, meats lab, poultry house and classroom facilities were excellent. On March 26, of a total of 676 students only eight students were absent, an amazing statistic when one realizes these students travel from 20 to 25 miles to get to school each day. I would like to teach in a similar situation. They mention 80 to 85% of their graduates either are immediately employed in agriculturally related occupations or go to college. The overall scholastic rank of the high school in the city of Philadelphia is 3rd of 40. This would be an excellent prototype for an agriculture/horticulture program in the Chicago metropolitan area.

C) B.O.C.E.S.

Students in the horse husbandry curriculum were actively involved and I believe learning well. The horticulture program was suffering from a low enrollment due to a lack of exposure within the high schools in the district. A very "strong" floral design instructor was attracting a large number of design students but was not encouraging people to carry their interest into the general field of horticulture.

D) John Bowne High School

An exciting school to visit. The active agricultural department in a large comprehensive high school in a highly populated metropolitan area was fascinating to observe. Their program made maximum use of a small (four acre) land laboratory. They emphasized an extensive summer program to introduce graduating 8th graders to agriculture. All 10th, 11th, and 12th graders are placed on the job at agriculture/horticulture related businesses and even on farms throughout the entire state.

III. Putting it all together - Relating information to Metropolitan Agriculture Core Curriculum

1. It will be comparatively easy to plan a core curriculum for students in the Chicago Metropolitan area.

2. It will be difficult to train or convert academic teachers to teach the core curriculum because the academic teacher does not always understand the vocational approach to teaching - "learning by doing."

3. The core curriculum should include two or three years of study. It should include an exploratory sequence followed by the technical areas to be covered in agriculture or horticulture.

4. Emphasis should be paced upon summer "internships" or "on the job placement" experiences to give students "hands on" experience.

5. A core curriculum should include an S.O.E. program if at all possible.

6. A garden tract program may be relatively easy method to get students involved in the summer program.

7. Cadet or summer programs in metropolitan areas should include the following businesses:

   Greenhouses, Golf Courses, Park Districts, Forest Preserves, Colleges or schools with extensive property to maintain, Landscapers, Farmers (dairy, beef, grain, etc.), Racetracks, Laboratory Animal Breeders, etc.

8. An extensive summer cadet program may be arranged using other FFA chapters and Vocational Agriculture departments as "leads."

9. Students should be introduced to FFA and become involved in an FFA chapter.

REVIEW OF COURSE OUTLINES

Approximately 25 course outlines were collected and reviewed to provide needed insight into the organization of the current content of the agriculture programs in Illinois. Agriculture instructors in Illinois tend to develop course outlines which are cross-sectional and are structured into enterprises and problem areas. A few of the course outlines included department and course objectives. The remaining outlines had no statements relating to objectives of the courses. However, many of the agriculture teachers include the objectives in their daily lesson plans.

The value in reviewing the course outlines for this project was the listing of the enterprises and problem areas being used by teachers. This list was then used as the foundation for the development of a questionnaire which was used to survey the agriculture teachers. The list was also used as a starting point for deciding on the enterprises and problem areas to include in the core curriculum.

As helpful as the course outlines are, a great deal of information is still missing. A beginning teacher is in need of more comprehensive information. None of the course outlines contained information beyond the listing of problem areas. These would not be much help in the day-to-day teaching and planning. There were no references or sources listed to aid the inexperienced teacher in preparing the daily plan. More guidance is needed for organizing and sequencing the problem areas over a four-year program.

The course outlines from the experienced teachers have, in many cases, been listed by years or courses of study and reflect community needs and local adaptability. These course outlines are the most valuable in revealing the important enterprises and problem areas in an agriculture program. The beginning teachers tend to list a complete cross-section of enterprises which would cover the four-year program.

Some of them have not yet distinguished the more important from the lesser important enterprises in their outlines.

The courses outlines gave the core project staff and advisory council members a point of reference and departure for determining core curriculum content. The outlines only indicate what to include in a program. They gave little information as to when to teach an enterprise or problem area. They also gave little assistance in determining sequence and importance to place on any particular enterprise or problem area in a local program.

SURVEY OF ILLINOIS AGRICULTURE TEACHERS

A survey of rural and metropolitan agriculture teachers in Illinois was conducted to obtain information on the following:

1. To determine if there is a difference between the units beginning rural agriculture teachers and experienced rural agriculture teachers emphasize as important to the core curriculum.
2. To determine if there is a difference between the units currently taught by beginning rural agriculture teachers and experienced rural agriculture teachers.
3. To determine if there is a difference between the units emphasized as important to the core curriculum when comparing experienced rural agriculture teachers.

The sample used in this study consisted of 50 rural agriculture teachers and 41 metropolitan agriculture teachers. A sample of both beginning and experienced teachers in rural areas was selected and one of each type was selected from each of the 25 sections in Illinois. This was done to secure input from different age groups and to give a geographical distribution among the rural agriculture teachers. A 94% return was obtained from the rural teacher and an 86% return was obtained from the metropolitan teachers.

The survey form was developed by reviewing courses of study used by agriculture teachers in Illinois and other states and using project staff for additional input on the units to include in the survey list. The form, which is included in this report as Appendix A, included 113 units of instruction. Teachers were asked to (1) indicate if they were currently teaching these units in the first two years of their program and (2) rate each unit on an importance scale of 1-5, from most important to least important for the first two years of a core curriculum.

An analysis of the results show that there was no significant difference in the units beginning and experienced rural agriculture teachers emphasize as important to the core curriculum. There was a significant difference between the number of units beginning rural agriculture teachers are currently teaching and the number of units experienced rural agriculture teachers are currently teaching in Illinois. The survey revealed that experienced teachers are teaching more units than beginning teachers in their current programs. Also, there was a significant difference in the units important to the core curriculum when comparing experienced rural agriculture teachers and experienced metropolitan agriculture teachers. However, common units of instruction were identified as important to both the rural teachers and the metropolitan teachers.

A summary of the units rated as important to the core curriculum by the rural agriculture teachers and the metropolitan agriculture teachers are included in this report. Only those units receiving the highest ratings (mean of 1.00-1.99) and those receiving a medium rating (mean of 2.00-2.99) are included.

RATINGS OF CURRICULUM UNITS
BY RURAL AGRICULTURE TEACHERS

	High Rating	Medium Rating
Animal Science		
	1. Swine	1. Sheep
	2. Beef	2. Dairy
	3. Breeding & Management	3. Careers in the Livestock Industry
	4. Livestock Selection & Identification	4. Livestock Marketing
	5. Feeding & Nutrition	5. Housing & Equipment
	6. Livestock Health	
	7. Livestock Judging & Showing	
Plant Science		
	1. Soybeans	1. Wheat
	2. Corn	2. Forage Crops
	3. Weed Control	3. Speciality Crops
	4. Plant Nutrition	4. Plant Growth & Development
	5. Seedbed Preparation	5. Tillage Equipment
	6. Insect & Disease Control	6. Marketing Crops
	7. Variety Selection & Seeding Practices	7. Careers in Plant Science
	8. Harvesting & Storage	8. Judging Crops & Showing
Horticulture		
	NONE	1. Olericulture
		2. Landscaping
		3. Arboriculture
		4. Careers in Horticulture
		5. Planting & Transplanting

High Rating	Medium Rating
Horticulture (continued)	
	6. Insect & Disease Control
	7. Plant Identification
	8. Plant Growth & Development
	9. Plant Propagation
	10. Care of Plants
	11. Landscape Planning
	12. Soils in the Nursery and Greenhouse
	13. Landscape Plants and Structures
Soil Science	
1. Soil Nutrients and Fertility	1. Soil Formation
2. Soil Erosion and Conservation	2. Surveying and Legal Land Description
3. Land-Use Selection	
4. Soil Components	
5. Soil pH	
Leadership	
1. F.F.A.	1. Program of Activities
2. Parliamentary Procedure	2. Occupational Survival Skills
3. Public Speaking	
Agribusiness and Records	
1. Record Keeping Procedures	1. Ag. Math & Metric Measurement
2. Supervised Occupational Experience Programs	2. S.O.E. Agribusiness Problem
3. Orientation to Agriculture	

Agribusiness and Records (continued)

High Rating	Medium Rating
4. S.O.E. Production Problem	
5. Careers in Ag. Supplies and Services	

Agricultural Mechanics

High Rating	Medium Rating
1. Shop Safety	1. Electricity
2. Tool Identificationa and Fitting	2. Agriculture Power
3. Careers in Agriculture Mechanics	3. Home Shop Development
4. Welding and Metals	4. Agriculture Implements and Machinery
5. Project Construction and Structures	5. Surveying
	6. Soldering

Ag. Products

High Rating	Medium Rating
NONE	1. Careers in Agriculture Products
	2. Meat Juding and Grading
	3. Grain and Grain By-Products

Resources and Forestry

High Rating	Medium Rating
1. Erosion	1. Pollution of Natural Resources
	2. Energy Conservation
	3. Wildlife
	4. Ecology
	5. Careers in Resources
	6. Careers in Forestry
	7. Forests
	8. Recreation

RATINGS OF CURRICULUM UNITS BY METROPOLITAN TEACHERS

Horticulture

High Rating

1. Floriculture
2. Landscaping
3. Greenhouse Operation and Management
4. Arboriculture
5. Turf Management
6. Nursery Operation and Management
7. Retail Sales
8. Plant Propagation
9. Care of Plants
10. Planting and Transplanting
11. Plant Growth and Development
12. Careers in Horticulture
13. Insect and Disease Control
14. Plant Identification
15. Soils in the Nursery and Greenhouse
16. Plants for Holidays
17. Greenhouse Environment
18. Greenhouse Practices
19. Landscape Planning
20. Landscape Plants and Structures
21. Nursery Practices

Medium Rating

1. Olericulture
2. Pomology
3. Showing Horticulture Plants
4. Horticulture Judging Skills
5. Horticultural Mechanics

High Rating	Medium Rating
Plant Science	
1. Plant Growth and Development	1. Speciality Crops
2. Plant Nutrition	2. Weed Control
3. Seedbed Preparation	3. Variety Selection and Seeding Practices
4. Careers in Plant Science	4. Tillage Equipment
5. Insect and Disease Control	
Animal Science	
NONE	NONE
Soil Science	
1. Soil Nutrients and Fertility	1. Soil Erosion and Conservation
2. Soil pH	2. Soil Formation
3. Soil Components	3. Land-Use Selection
Leadership	
1. Occupational Survival Skills	1. Program of Activities
	2. F.F.A.
	3. Public Speaking
	4. Parliamentary Procedure
Agribusiness and Records	
NONE	1. Recordkeeping Procedures
	2. Supervised Occupational Experience Programs
	3. SOE Horticulture Problem
	4. Orientation to Agriculture
	5. Careers in Ag. Supplies and Services

Ag. Mechanics

NONE

1. Shop Safety
2. Tool Identification and Fitting
3. Careers in Agriculture Mechanics
4. Project Construction and Structure
5. Surveying
6. Drafting and Planning Projects

Ag. Products

NONE

1. Fruit and Vegetable Processing
2. Careers in Agriculture Products

Ag. Resources and Forestry

1. Energy Conservation

1. Ecology
2. Careers in Resources
3. Careers in Forestry
4. Pollution of Natural Resources
5. Recreation
6. Forests
7. Erosion
8. Wildlife

SURVEY OF NEEDS FOR INSTRUCTIONAL MATERIALS

The Vocational Agriculture Service conducted a survey of all secondary teachers of agricultural occupations in Illinois to determine instructional materials teachers needed in the areas of FFA and Supervised Occupational Experience Programs. A copy of the survey form is included in this report as Appendix B. The survey form was sent to 425 teachers and 177 or 41.6% of the teachers responded.

The areas which teachers indicated should be covered by new teaching aids ranked in order of importance were as follows:

1. Supervised occupational experience programs
2. Foundation awards for production areas
3. Careers
4. Leadership training
5. Founcation awards for agribusiness
6. FFA program of activities
7. Public speaking
8. Parliamentary procedure
9. Chapter awards
10. Judging contests
11. Conducting chapter meetings
12. Chapter banquets
13. History of Illinois FFA

Additional areas of interest which teachers mentioned as areas which could be covered by teaching aids were as follows:

1. How to Become a State Officer
2. FFA Appearance and Dress at Public Meetings
3. Public Relations
4. FFA as Integral Part of Total Vo-Ag Program
5. Degree Applications
6. Proper Way to Fill out Cumulative Records

7. Duties of Officers
8. General FFA Operations and Integration
9. Student Problems for Horticulture Areas and Improvements Projects
10. Update on Tom Farmer
11. Shop Projects
12. Promotion of FFA Week
13. FFA Foundation
14. FFA Alumni
15. Heritage Program
16. Cooperative Activities
17. Safety
18. BOAC
19. State Convention
20. Community Projects
21. State and National Involvement
22. Rural Safety
23. How to Have an Active FFA Chapter
24. Opportunities with being an FFA Member
25. Recording Secretary Minutes
26. Famous Men with FFA Backgrounds and how it Helped Them, i.e., Jimmy Carter
27. Field Trips
28. Displays and Bulletin Boards
29. Radio and TV Programs

The type of aid which teachers rated as being most beneficial were in order of importance--

1. Slide set with cassette narration
2. Slidefilm
3. Units
4. Workbooks
5. Study guide with cassette narration
6. Transparencies

In response to a question concerning the type of FFA aid used most often, teachers listed the following:

1. FFA Manual
2. PCA Student Handbook
3. VAS Slidefilms
4. VAS Parliamentary Procedure Handbook
5. Movies (i.e., Stars Over America, Public Speaking)
6. Chapter Officer Handbook
7. Past chapter officers, Award winner, American Farmers, etc., as resource persons
8. Advisor's Guide (Handbook)
9. Illinois FFA Foundation Annual Report
10. FFA "Bluebooks"
11. Chapter program of activities
12. VAS Publications (Units)
13. History of ILL. FFA, First Fifty in FFA
14. Self-Made Worksheets, Transparencies, etc.
15. All SOEP Recored Books (including past)
16. Award "Boards"
17. Application Forms
18. Transparencies

19. Chapter history (scrapbook)
20. National and State Magazine
21. Present Chapter Officer Presentation
22. Ladder Charts on Parliamentary Procedure
23. FFA Leadership and Personal Development Series (Ohio)
24. History of National FFA
25. VAS unit on Records
26. State Officer Presentation
27. FFA Instructional Materials (Texas)
28. FFA Creed and Creed Contest
29. FFA Leadership Training School
30. Class Lecture
31. Booklets from National Supply Service
32. Judging Booklets
33. National Foundation Materials
34. National FFA Workbook
35. Role Playing
36. Banquets
37. Conventions
38. Study Guide on FFA, FFA Workbook
39. What is FFA
40. The FFA Organization
41. Farm Journal Parliamentary Procedure Manual
42. Illinois FFA Slide Sets
43. Robert's Rules of Order
44. FFA Paraphernalia
45. National FFA Slide and Tape Series

46. "I Dare You Book"
47. FFA Jacket
48. FFA Foundation Slide Set
49. Judging Contest Rules
50. Slides

EMPLOYMENT TRENDS IN ILLINOIS AGRICULTURE

INTRODUCTION

This chapter reviews agricultural employment in Illinois and attempts to identify current labor needs. The facts contained in this review will provide part of the information needed to formulate a new agricultural occupations curriculum for Illinois high schools. Agricultural activity is also examined, and characteristics of Illinois agriculture are briefly discussed.

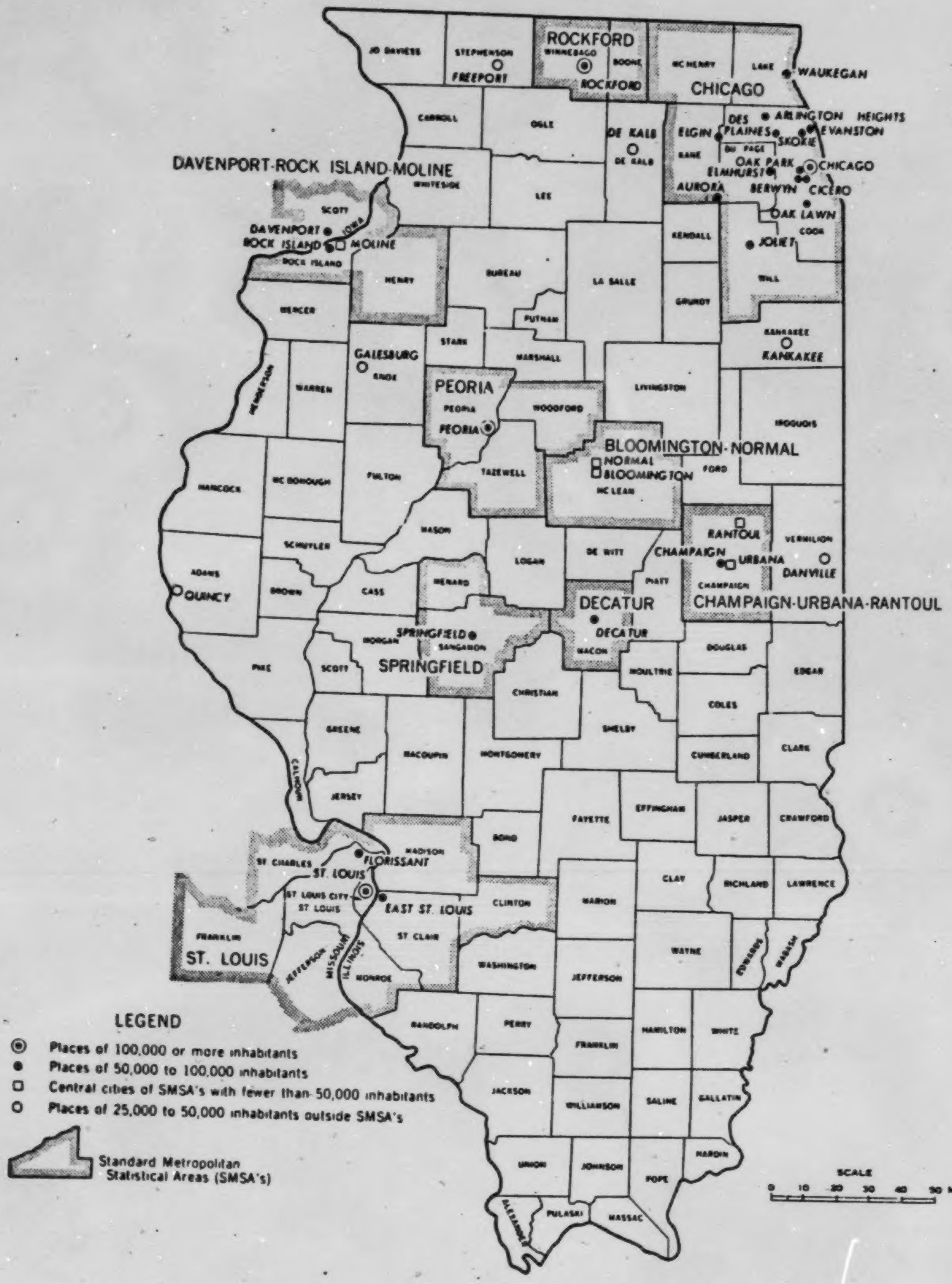
The examination of employment trends in Illinois agriculture is carried out within the framework of the seven taxonomic areas outlined by the U.S. Office of Education (Employment in Agricultural and Agribusiness Occupations, p. 8). The taxonomic areas are:

Agricultural Production
Agricultural Supplies & Services
Agricultural Mechanics
Agricultural Products
Ornamental Horticulture
Renewable Natural Resources
Forestry

The seven taxonomies represent a concept of agriculture that is markedly broader than the traditional, more limited view of farmers, fields and tractors. The expanded concept was officially established with the Vocational Education Act of 1963 which directed that vocational agriculture training be expanded to include "knowledge and skills in agricultural subjects, whether or not such occupations involve work of the farm or of the farm home" (Ibid., p. 1). The outcome of this act meant that the production of agricultural products, agricultural supply and services, mechanics, marketing, processing, ornamental horticulture, conservation and forestry all became the concern of those working with vocational education programs in agriculture. This expanded definition removed agriculture from the exclusive rural sphere and also made it a legitimate concern of the urban areas where a majority of farm inputs are manufactured, food processing takes place and where various aspects of horticulture and other agriculturally-related services abound.

Because much agricultural activity takes place in urban areas under this expanded definition, an explanation of what is considered urban in Illinois is in order. For the purposes of this paper, metropolitan or urban areas are those that lie within the Standard Metropolitan Statistical Area (SMSA). An SMSA is a geographical area created by the U.S. Bureau of the Census to present general purpose statistics. An SMSA consists of a county or a group of counties containing at least one city with a population of 50,000 or more. Also included are adjacent counties which are metropolitan in character and economically and socially integrated with the central city (U.S. Bureau of the Census, User's Guide, 1970, pp. 83-85). The map on the following page shows that a considerable portion of Illinois falls within the SMSA definition. Rural areas are those which lie outside the SMSA's, although land is farmed in SMSA counties.

ILLINOIS


ROCKFORD
WINNEBAGO
BOONE
ROCKFORD
JO DAVIESS
STEPHENSON
FREEPORT
MC HENRY
LAKE
WAUKEGAN
CHICAGO
CARROLL
OGLE
DE KALB
DE KALB
ELGIN
DES PLAINES
ARLINGTON HEIGHTS
EVANSTON
SKOKIE
KANE
DU PAGE
OAK PARK
CHICAGO
ELMHURST
AURORA
BERWYN
CICERO
OAK LAWN
COOK
DAVENPORT-ROCK ISLAND-MOLINE
WHITESIDE
LEE
SCOTT
IOWA
DAVENPORT
ROCK ISLAND
MOLINE
ROCK ISLAND
HENRY
BUREAU
LA SALLE
KENDALL
JOLIET
WILL
GRUNDY
PUTNAM
MERCER
STARK
MARSHALL
KANKAKEE
KANKAKEE
GALESBURG
KNOX
PEORIA
PEORIA
PEORIA
WOODFORD
LIVINGSTON
HENDERSON
WARREN
IROQUOIS
BLOOMINGTON-NORMAL
NORMAL
BLOOMINGTON
MC LEAN
FORD
HANCOCK
MC DONOUGH
FULTON
TAZEWELL
MASON
RANTOUL
VERMILION
CHAMPAIGN
URBANA
DANVILLE
SCHUYLER
ADAMS
DE WITT
LOGAN
PIATT
CHAMPAIGN
CHAMPAIGN-URBANA-RANTOUL
QUINCY
BROWN
CASS
MENARD
DECATUR
DECATUR
MACON
SPRINGFIELD
MORGAN
SANGAMON
SPRINGFIELD
DOUGLAS
PIKE
SCOTT
MOULTRIE
EDGAR
CHRISTIAN
COLES
SHELBY
GREENE
MACOUPIN
MONTGOMERY
CUMBERLAND
CLARK
CALHOUN
JERSEY
FAYETTE
EFFINGHAM
JASPER
CRAWFORD
BOND
MADISON
ST CHARLES
FLORISSANT
ST. LOUIS
CLAY
RICHLAND
LAWRENCE
ST LOUIS CITY
ST LOUIS
EAST ST. LOUIS
CLINTON
MARION
FRANKLIN
ST. LOUIS
ST. CLAIR
WAYNE
EDWARDS
WABASH
JEFFERSON
MISSOURI
ILLINOIS
MONROE
WASHINGTON
JEFFERSON
RANDOLPH
PERRY
FRANKLIN
HAMILTON
WHITE
JACKSON
WILLIAMSON
SALINE
GALLATIN
UNION
JOHNSON
POPE
HARDIN
ALEXANDER
PULASKI
MASSAC
SCALE
0 10 20 30 40 50 MILES
LEGEND
Places of 100,000 or more inhabitants
Places of 50,000 to 100,000 inhabitants
Central cities of SMSA's with fewer than 50,000 inhabitants
Places of 25,000 to 50,000 inhabitants outside SMSA's
Standard Metropolitan Statistical Areas (SMSA's)

401
U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

APPROACH

The assessment of employment needs for Illinois agriculture was made by gathering information primarily from secondary sources. Reports and studies on employment needs made by institutions and agencies in Illinois and elsewhere were reviewed. Material was gathered from the following U.S. censuses:

1974 Census of Agriculture
1977 Census of Manufactures,
Preliminary Report
1972 & 1977 Census of Governments
1977 Census of Retail Trade
1977 Census of Service Industries
1972 Census of Wholesale Trade

Various Illinois state agencies provided assistance and information, primarily the Illinois Bureau of Employment Security and the Illinois Department of Agriculture-U.S. Department of Agriculture, Illinois Cooperative Crop Reporting Service. Other offices and agencies contacted were the Illinois Department of Conservation, the Illinois Environmental Protection Agency, and the Federal Environmental Protection Agency, Region 5. Agricultural specialists on the University of Illinois at Urbana-Champaign campus were contacted, and telephone interviews were conducted.

A number of difficulties were encountered during the course of the study which should be discussed. First of all, information is not yet available from the 1978 Census of Agriculture forcing reliance on the older, 1974 census. Where possible, current information was taken from material provided by the Illinois Cooperative Crop Reporting Service to supplement the older data. A second problem was lack of detailed employment statistics which are available for only a few agriculturally-related occupations. Therefore it was not possible to review actual employment figures for all areas within each taxonomy. The only exception was the farm worker category. The Illinois Cooperative Crop Reporting Service gathers statistics on the number of farm workers in the state on a quarterly basis. The Bureau of the Census also compiles data on farm worker employment. In an effort to obtain information on the number of individuals employed in 1970 in agriculturally related occupations in Illinois, the Bureau of the Census in Washington, D.C. was contacted in the hope that computer data existed which could be recovered. It was learned that information at the level of detail needed was unobtainable. Only those occupations listed in the 1970 Census of Population provide data on the number of individuals within an occupation. A limited number apply to agriculture.

The Illinois Bureau of Employment Security was a valuable source of information as that office provides employment projections for various industrial areas, agriculture included. Like the U.S. Bureau of the Census, only a restricted number of occupations are examined in depth. The projections of future employment are made by imposing national trends upon the Illinois employment situation. Therefore, comprehensive data on agriculturally-related occupations were not available, farmworkers excepted.

Those studying Illinois employment trends in the future will be able to take advantage of a new program to be initiated in about two years. The Illinois Bureau of Employment Security will gather employment information on about 2,000 occupations throughout the state utilizing mail surveys and personal interviews (Cohen, personal interview).

For the time being, however, the Federally based projections must suffice. It should also be noted that other states have encountered similar difficulties when conducting nonfarm, agriculturally-related employment studies (Mondart, p. 3).

Efforts to identify employment needs are made even more difficult because state and federal agencies have not yet accepted or come to terms with the expanded definition of agriculture. For example, suitable employment figures are not gathered as a matter of course by the U.S. census from which a true picture of agricultural employment in all areas can be gleaned. Agriculture, according to the official view, means farmers and farm workers. It should be noted that efforts are being made to remedy the situation at the Federal level. The U.S. Department of Agriculture, Department of Health, Education, and Welfare, U.S. Bureau of the Census and the Department of Labor formed a joint committee in the early 1970's to identify the distribution and number of agricultural occupations throughout the work force. As a result a report was produced, Employment in Agricultural and Agribusiness Occupations, which assessed and identified the scope of agricultural occupations and their dispersal throughout the nation's industry.

The lack of detailed, comprehensive information on agricultural occupations precluded compiling statistically valid projections. The assessments of the seven taxonomic areas were made by gathering information from the sources noted above and identifying a trend indicated by the composite picture. The conclusions are intended to infer, not to validate, the employment situation.

Before discussing employment trends it should prove helpful to provide a brief background of Illinois agriculture, touching upon its scope and identifying some factors presently at work in urban and rural areas. The sketch will supply a framework for the survey that follows.

AGRICULTURE IN ILLINOIS

Agriculture plays a significant role in Illinois both on a state and national level. Over 80 percent of the total land area in Illinois, over 28 million acres is in farms. The land and buildings alone are worth $46 billion. In 1978, Illinois ranked first in producing soybeans and second in corn production. The market value of crops produced in 1978 was over $4 billion, while livestock and livestock products brought over $2 billion. In addition, Illinois ranked second in production of Jonathan apples in 1978 and produced nearly one-fourth of the nation's swiss cheese, leading the nation for that product. In 1978, over 9 million hogs and one and a half million cattle and calves were marketed. In addition, 6 million hens and pullets and 400,000 turkeys were raised. Illinois ranked second in hog production and seventh in fed cattle marketed in 1978 (Illinois Farm Facts, 1979).

Illinois' importance as an agricultural state is dramatically illustrated when its role in the export market is examined. In 1978, 30 percent of the corn and 56 percent of the soybean and soybean products produced in the United States were exported. As the nation's leading producer of soybeans and second highest producer of corn, Illinois ranked first in feed grain and feed grain products and soybean and soybean products exported (Schmidt, p. 64). In addition, the state ranked third in the export of meat and meat products (Illinois Agricultural Statistics, p. 59). About 60,000 farm workers and 84,000 nonfarm workers were responsible for the export level. Illinois has consistently been the largest exporter of agricultural products since 1964, showing an increase of total agricultural exports from 8.3 percent in 1964 to 10.1 percent in 1978. The value of exports for the same period has grown from $504 million to $2,770 million (Schmidt, pp. 4a-5).

Agricultural exports play an important role in the nation's economy. They are a factor in paying for foreign products and improving the United State's balance of payments. It has been discovered that every dollar of agricultural exports generates another dollar's (96 cents) worth of output in the rest of the economy. This means that the national figure of $27.2 billion of 1978 exports has created another $27 billion worth of output in the national economy. Examples of generated output are the increased purchase of consumer goods by farmers due to higher profits, a greater degree of business activity initiated through the marketing, financing, processing and transportation of the exports and the purchase of materials needed to produce the exports (Ibid., p. 4-4a). As the leading exporter of agricultural products, Illinois would logically receive a large share of the economic benefit.

Agricultural production contributes significantly to another aspect of Illinois economy, manufacturing. A large and active body of industries exist producing farm supplies and equipment which utilize Illinois-grown products or process agriculturally related materials brought into the state, such as wood. The magnitude of the area makes it worthy of mention. For example, in 1972, there were 18,481 manufacturing firms in Illinois, 11.6 percent of which were agriculturally related. All Illinois industries employed over 1.3 million workers and produced goods shipped at a value of over $53 billion. Of this amount, food and kindred products shipments were valued at over $9 billion (Economic Importance of Selected Industries). It should be noted that manufacturing is primarily urban. In 1972, 12,368 out of 18,481 manufacturing firms were located in Cook and DuPage counties, two of the most intensely urbanized areas in the state (1972 Census of Manufactures, Vol, III, p. 14-44.).

In additon to the production aspect of agriculture and industry a number of other factors exist in the agricultural area which should be noted. One of the more important is the change in the number and size of Illinois farms occurring due to mechanization and the increasing cost of farming.

The use of machinery in agriculture has been an increasingly important factor in American farming for nearly a century. The process of more efficient machines replacing farm labor began in earnest after World War II and has continued to the present. What makes the current situation different from earlier times is the degree of mechanization. Highly sophisticated machinery enables a few workers to plant, cultivate and harvest large fields in a short period of time. General decline in the number of farm operators and workers throughout the nation followed.

Along with the increased use of mechanization, there have been large increases in the use of fertilizers and chemicals. Illinois is the primary consumer of fertilizer in the United States (1974 Census of Agriculture, Vol. IV, pt. 2, p. 24). The resulting escalation in the cost of farming has made it difficult for young, would-be farmers to purchase the necessary land and equipment. At the same time those with capital can afford to expand their holdings. As a result the number of Illinois farmers is declining following the national and midwestern pattern while the average size of the Illinois farm is increasing faster than the national rate (Illinois Farm Report, IFR - 80-01).

For example, in 1978 there were 109,000 farms in Illinois; the projection for 1980 is 105,000, a loss of 4,000 farms (Ibid.). The recent figures follow an established trend. In 1969, there were 123,565 farms in Illinois, but by 1974 the number had been reduced to 111,049. (1974 Census of Agriculture, Vol. IV, Pt. 2, p. 15). The decline appears to be occurring at a relatively slow rate. From 1975 to 1979, the rate of decline was about 6 percent, or 1.6 percent per year (Illinois Agricultural Statistics, p. 2). Slowed or not, the decline is an important factor on the agricultural scene. It should be noted that a portion of the decline can be attributed to the changing definition of a farm. Also, it will be shown later that, while the number of farmers has been decreasing, the number of rural, nonfarm residents has been increasing during the past decade.

Efficient machinery and availability of agricultural chemicals coupled with the increased demand for food and other agricultural products created by a rapidly expanding world population have produced another component of agriculture, intensive farming. The pressure to produce stems both from demand and from the demonstrated ability of the farmer to meet that demand. An indication of the United State's role in contributing to the world's food supply can be seen from the productivity of the nation's farm workers. Using modern technology, the average American farmer produced enough farm products in 1978 to supply a total of sixty-five people, forty-six and a half in the United States and eighteen and a half abroad. The number of people supported per year has increased steadily from 1960, when the farmer supplied twenty-t individuals at home and only three abroad (Illinois Farm Reports, IFR-80-01). As a leading agricultural exporter, Illinois plays an important role in this trend.

The pressure to produce has pushed farmers to farm more intensively especially as it relates to increased grain production. A number of consequences have resulted. The first consequence is the high production level noted above. The second is the threat of increased soil erosion, and the third is the loss of wildlife. Finally, there has been some loss in the aesthetic quality of the countryside.

As more land is put into production and as production intensifies the likelihood of soil erosion increases. At the present time it is estimated that over nine million acres of Illinois cropland are excessively eroded. This means that each acre is losing three to five tons of topsoil per year and sometimes as much as eleven tons, depending on soil type and slope (Bauer, newspaper article; Walker interview). Cropland experiences a greater erosion rate than does pasture land, the former is losing an average of six and a half tons per acre per year and the latter losing over three tons per acre per year (Walker, interview). It does not automatically follow that intensive farming creates excessive erosion, but generally the more land farmed, the greater the erosion potential.

The loss of wildlife is another consequence of intensive farming which can be illustrated by the dramatic decline in the pheasant population over the last fifteen years. The pheasant range in Illinois lies roughly in the northern two-thirds of the state. Hay, small grains and uncultivated farmland provide the reproductive habitat for the bird. From a peak in the early 1960's, the pheasant has declined 92 percent rangewide because of two factors, winter mortality and loss of habitat due to changes in farming activity. To illustrate, since the mid-1960's there has been a 54.2 percent decrease in land put into hay and small grain, 2.4 million acres, and 1.8 million acres of previously uncultivated farmland put into production (Warner, Interview). A similar decline of cottontail rabits has been noted, as their habitat such as fence rows, has been removed to create bigger fields to accomodate the large farm machinery.

Finally, some of the beauty has been taken from the countryside as the land has assumed a homogeneous character created by the removal of fences, hedgrows and all unnecessary structures. These changes have come about in response to the needs of mechanized farming and the change in farm ownership. As the number of farmsteads has been declining, farmstead size has been increasing. The unused farmhouse and buildings become a tax liability and are pulled down. There can be no question that farmland must be utilized, but a landscape with little variety to make it distinctive detracts from the quality of life of those who live there. The loss of character and beauty be part of the price paid for increased production. Education for farmers and rural, nonfarm residents about wildlife and awareness of their surroundings may be helpful in alleviating these problems.

The final factor considered in this section is the recent increased migration of people into rural areas. Between April, 1970 and July, 1973, nonmetropolitan counties throughout the United States grew 4.2 percent. This was a greater rate of growth than that experienced by metropolitan counties, which grew 2.9 percent for the same period. (Beale, p. 6). The significance of these percentages is that they signaled a reversal of a rural-urban migration pattern which had been active since the 1940's (Ibid., p. 4).

World War II initiated a rapid outmigration from the rural areas to the cities throughout the United States. During the 1950's and 1960's the outmigration continued with a net average of more than one million people leaving the farm annually. Most nonmetropolitan counties lost population during these years despite a high national birthrate (Ibid., p. 4). Although the outmigration slowed somewhat in the 1960s, and studies revealed that people would prefer to live in a nonmetropolitan area, the rapid population reversal came as a surprise to students of the field. (Ibid., p. 6; p. 14). The present trend is valid as rural counties not adjacent to metropolitan areas are increasing more rapidly than metropolitan counties. Thus, the process of decentralization is not confined to metropolitan sprawl (Ibid., p. 7).

It is not yet possible to determine if the reverse migration trend will continue; nor can the effect of that migration be evaluated at this time. A number of results can reasonably be anticipated. Housing demand will increase as the number of people grows. This in turn will take a certain amount of farm land out of production as farmers sell or develop their land. More utilities, schools and public services will have to be provided as existing systems prove to be inadequate to the increased use, calling for higher taxes. What is certain in that the character of rural America as it existed for 35 years is undergoing a significant change. Whether the impeding fuel shortage will again reverse the migration remains to be seen. At any rate, education about agriculture and rural living should be made available to these rural residents even though they may not live on farms.

EMPLOYMENT NEEDS BY TAXONOMIC AREA

The information presented in the following section deals with the employment trends in each of the seven taxonomic areas. An effort has been made in each case to give an indication of economic activity including the number of farms, number of employees and the market or sales value of products generated as a result of the activity. The information was taken from a number of sources such as the U.S. Bureau of the Census, special government and state reports, employment studies and the Illinois Crop Reporting Service. Information was also gathered by conducting telephone interviews with individuals throughout Illinois who possessed special knowledge about a taxonomy.

Employment projections were made on the basis of degree of economic activity, information gathered by talking to experts in the various areas, projections made by various employment studies and information provided by the Illinois Bureau of Employment Security (Bureau). The Bureau's staff and publications were extremely valuable in the production of this report. Two Bureau publications were especially useful, "Occupational Outlook Information Report, 1974-1985" and "Occupational Outlook Information Report, 1976-1985." In addition, numerous conferences were held with Bureau staff. Employment trends were identified for each taxonomy after reviewing all relevant material gathered for the study.

It should be noted that Bureau employment projections are based on two factors. One has to do with the number of jobs generated or lost annually by the growth or negative growth of an industry. The second is the number of job openings created annually by vacancy, i.e. openings caused by individuals retiring, dying or changing jobs. The total of the two factors produced the projected number of openings in a year.

As was noted earlier in the report, census data exist for only a limited number of occupations within each taxonomy. The occupation receiving the most detailed study in Agricultural Production, farm workers, is reviewed by both the census, the Bureau and the Illinois Cooperative Crop Reporting Service. Lack of detailed occupational information has made it necessary to deal in general, broad trends. The employment trends discussed below are made on the basis that conditions will remain relatively stable and that high production will continue in the agricultural area, whether it be concerned with soybeans, plywood, shrubs or corn. A complete description of the taxonomies can be found in the appendix.

AGRICULTURAL PRODUCTION

This taxonomy contains those occupations requiring skills and knowledge in the production of plants, animals and their products. It is this area that contains those activities traditionally making up agriculture. Occupations in this taxonomy require a wide range of skills ranging from animal breeding to marketing, and from management to mechanics. The care and propagation of pets, wildlife and laboratory animals is also included in this category. The following review of farming activity will document the importance of agriculture in Illinois and facilitate the identification of competencies which should be stressed in the new curriculum.

Crop Production

The most important crops grown in Illinois are soybeans, corn and wheat. The importance of soybeans and corn in both the national and state export market was noted above. Both soybeans and corn set production records in 1979, soybean producers growing 22 percent more bushels than in 1978, which was 11 percent over the previous record set in 1977. Corn also reached a production peak, 14 percent higher than in 1978 and 8 percent above the previous record crop of 1975. Wheat, which does not hold as prominent a place in crop production, was up 58 percent in 1978 (Illinois Farm Report, IFA-80-03). All major crops reached high production levels in 1979, along with many minor ones. In all, 23.4 million acres of crops were harvested in that year (Ibid.). Minor crops included barley, oats, rye, sorghum, hay, red clover seed, timothy seed and lespedeza seed.

Fruit production also plays a role in Illinois agriculture. Illinois ranked tenth in 1974 in the production of apples (1974 Census of Agriculture, Vol. IV, Pt. 2, p. 89). In 1979, production was up 24 percent from 1978, yielding 110 million pounds with a value estimated at $12.5 million. Golden Delicious was the leading variety, followed by Jonathan and Red Delicious (Illinois Farm Report, IFA-80-03). Peaches are also grown. Fifteen million pounds were produced in 1979 at an estimated value of $2.8 million (Ibid.).

Vegetables are grown for two markets, processing and fresh market. In 1979, the principal processing vegatables produced (cabbage for kraut, cucumbers for pickles, lima beans, green peas, sweet corn, snap beans, tomatoes and beets) was estimated at 373,280 tons and a value of $33.8 million. Fresh market vegetables (sweet corn, snap beans, cabbage, carrots and asparagus) had a value of $6.8 million in 1979 (Ibid.). Illinois ranked ninth in 1974 in vegetables harvested for sale in the United States (1974 Census of Agriculture, Vol III, p. 79).

Bee colonies and the production of honey and beeswax should also be noted. (Bees are included here due to their close association with certain crops.) In 1978, there were 38,000 bee colonies which produced 1.6 million pounds of honey bringing a value of $1.million. Thirty-six thousand pounds of beeswax was also produced that year (Illinois Agricultural Statistics, p. 9). It should be pointed out that some of the types of production noted above are cncentrated in certain localities. Education cannot, of course, be provided about all of these products for all communities.

Livestock Production

Beef and dairy cattle, pigs and hogs, sheep and lambs and chickens and turkeys are the primary livestock raised in Illinois. Although there has been a general decline in livestock farms for all species between 1975 and 1978 (for example the number of cattle farms dropped from 62,000 to 58,000 during that period) the value continues to rise. The value of all species increased from $846,152 in 1975 to $1.7 million in 1979.

Hogs accounted for 18 percent of Illinois agricultural cash income in 1978 while cattle made up 12 percent. All livestock accounted for 35 percent of cash income for that year compared to 65 percent for all crops (Illinois Agricultural Statistics p. 7). The number of sheep and lambs totaled 190,000 on January 1, 1980, up 3 percent from a year ago (Illinois Farm Report, IFR-80-04). Illinois ranked tenth in the nation in 1974 for the number of horses and ponies on farms (1974 Census of Agriculture, Vol. IV, Pt. 2, p. 45). There appears to be increased activity by those breeding racehorses in Illinois, partly due to an incentive program initiated under the Horse Racing Act of 1975. Illinois racehorse breeders hire more than 2,000 people annually, one half on a full-time basis. Veterinary bills for the industry are $2.5 million annually (Lakner, pp. 1-2).

In 1980, 5.5 million layers produced 110 million eggs. Of course, a high percentage are found on a relatively few specialized farms. There were 235,000 milk cows as of January 1, 1980, which produced 198 million pounds of milk (Illinois Farm Report, IFR-80-04; IFR-80-05). While Illinois is not a leading milk producer, it does hold an important place in producing dairy products, ranking first in the nation in producing swiss cheese and second in munster (Illinois Agricultural Statistics, p. 59).

Employment Outlook

When considering employment in the area of agriculture, it is advisable to keep in mind that the number of farm workers has been underrated by the Federal census. This is due to the fact that census data does not show secondary employment. In the 1970 census an individual holding two jobs recorded the one at which he or she spent the most hours during the census reference week which was March 12. As a result many farmers who were working second jobs were not listed as farmers. It is estimated that nationally the numbers of farmers who were not counted within that category numbered a million. (Employment in Agricultural and Agribusiness occupations, p. 7). Hired farm workers were also affected by the reference week. Sixty-nine percent of hired farm workers were engaged in farmwork for less than seventy-five days, and the employment period generally did not include March. Again, the farm sector was underreported (Ibid., p. 8). Total U.S. agricultural employment adds up to nearly ten million people, including the million that were understated and allowing for the low number of hired workers that were counted (Herbst, p. 9). This figure includes all aspects of agriculture and argibusiness. Illinois' share of agriculture workers was reported as 186,710 (Ibid., p. 5). It should also be pointed out that in some cases relatively few people may be dependent on the occupation discussed for making a living. For example, some persons may own race horses or raise Christmas trees but derive the major source of their annual income from other sources.

The Illinois' employment picture within this taxonomy is somewhat difficult to assess. The Illinois Bureau of Employment Security states that the farm labor force is in a state of decline which will continue through 1985. Both the figures and projections in the 1978 publication, "Occupational Outlook Information Report, 1974-1985," and the information gathered from the 1980 report confirm this trend. The Bureau of Employment Security has prepared projections on the following occupations directly related to agricultural production:

Farmers (Owners & Tenants)
Farm Managers
Farm Labor Supervisors
Farm Laborers, Wage Workers
Farm Laborers, Unpaid Family
Farm Laborers, Self-Employed

The Bureau uses the same farm worker categories utilized by the U.S. Bureau of the Census. This includes on-farm workers, self-employed farm service workers and workers in all areas of ornamental horticulture, including nurseries, greenhouses and florists (1970 Census of Population, Classified Index, pp. 0-126 to 0-128). Figures show that in Illinois there were 2,806 fewer farmers and farm workers working in 1974 than in 1970, a decrease of 2.10 percent (Occupational Outlook, 1978, p. 84). The most recent projections for 1985 indicate a continued loss of 30,851 positions between 1976 and 1985, or a decrease of over 3,000 workers a year (Occupational Outlook, 1980, p. 109). The decrease in employment was attributed to the decrease in the number of farms and the increased use of machinery (Occupational Outlook, 1978, p. 38).

Only the farm managers and self-employed farm laborers are expected to hold their own. For example, the total employment for farm managers in 1970 was 871; in 1974 it rose to 895 and is projected to register 1,037 in 1985 (Occupational Outlook, 1978, pp. 64 and 84). In addition, farm managers show no signs of negative growth. Openings in the occupation are projected at 101 every year to 1985. The self-employed laborer appears to be stable as eight openings are projected annually from 1975-1985 (Occupational Outlook, 1980, p. 99).

In contrast to the decline in farm workers projected by the Bureau of Employment Security, the Illinois Cooperative Crop Reporting Services reports an increase in Illinois farm employees. It should be noted that the Illinois Crop Reporting Service employs a more restricted definition of farm worker than does the Illinois Bureau of Employment Security. The Illinois Crop Reporting Services identifies on-farm workers, as those who provide agricultural services on the farm such as butchering or custom milling, and laborers in nurseries as farm workers. Florists and landscape-related workers are not included. In October, 1979, the total number of farm workers was 198,000, 5.9 percent more than were working during the same period in 1978. The number of farm workers in Illinois rose from 189,000 to 198,000 between October, 1975 and October, 1979 (Illinois Agricultural Statistics, 1979, p. 103). The increase opposes the national trend which registered a 3 percent decline in the number of farm workers between October, 1978 and October 1979 (Illinois Farm Report, IFR-79-18).

It is impossible to determine at this time if the growth is temporary or the beginning of an increase in farm employment of longer duration. It appears to be in line with predictions made in Michigan and Indiana where a demand for more farm workers is anticipated (Theumel, p. iv, Legacy, p. 103). Whatever the outcome, the need for farm workers will continue. Even if the negative predictions prove to be correct in the long run, the need for an average of 2,977 new farmers and farm workers annually is projected for Illinois through 1985 by the Bureau.

AGRICULTURAL SUPPLIES AND SERVICES

This taxonomy contains activities which supply and assist the farmer in producing a crop, raising animals or marketing what is produced. A diverse range of activities makes up this taxonomy such as the sale and distribution of seeds, feed, fertilizer and agricultural chemicals. Agricultural services in the form of custom work are included such as soil preparation services, planting, cultivating and harvesting and preparing crops for market. Veterinary and animals services, such as artificial insemination, are part of this area along with farm labor contractors. Auctioneers, farriers and animal caretakers are also included.

It is possible to gain some idea of the magnitude of the agricultural supplies and services taxonomy by reviewing some of the establishments that serve the farm directly. In 1974, Illinois had 1,057 establishments engaged in the following activities: soil preparation, planting, harvesting, veterinary services (livestock and small animal); animal services and labor contractors. The gross receipts for the combined activities were $102.7 million. The greatest amount of money was spent for veterinary services, $39.9 million followed by $10.3 million for soil related custom work and $8.4 million for animal services (1974 Census of Agriculture, Vol. III, pp. 16-26). There was an increase of 31.4 percent from 1969 to 1974 in the number and amount of services (1974 Census of Agriculture, Vol 1, Pt. 13, p. xv). Because the results of the last agricultural census have not yet been released, it is not possible to determine through census data if the increase has continued.

Feed, seeds and agricultural chemicals are a vital part of the agricultural supply and service area. In 1972, for example, there were 763 grain elevators in Illinois. These firms employed 4,888 individuals and had sales of over $2 billion (1972 Census of Wholesale Trade, p. 14-5). At the present time there are about 1,200 grain elevators in the state. There are also between 1,200 and 1,400 agricultural chemical retail outlets throughout Illinois. As was noted above Illinois is one of the primary consumers of agricultural chemicals in the United States.

In 1979, about 4.5 million tons of agricultural chemicals were sold at a value of around $50 million (Burling, interview).

Additional supply and support services cover a variety of areas. There were 969 farm and garden machinery and equipment outlets, 962 of which were run by merchant wholesalers. The number of people hired for all establishments was 7,896 and total sales were $933.5 million. Establishments that handled farm products (raw materials) numbered 1,343, with total employment at 8,299 and sales of over $4.6 billion. Farm supplies were handled by 1,349 firms with sales during 1972 of over $1 billion and 7,668 people on the payroll. (1972 Census of Wholesale Trade, pp. 14-5 to 14-8). In the urban areas pet shops are active. Between 1972 and 1977 there was a significant increase in sales, growing from $9.3 million in 1972 to $20.9 million in 1977. The number of employees per establishment also increased during that period (1977 Census of Retail Trade, Tables 2 and 3).

Employment Outlook

Agricultural supplies and services is a viable, active field, although employment opportunities are not consistent in all areas. Woods reported in his study of Illinois agriculture college graduates that 12.4 percent were placed in the agriculture supply area (Woods, p. 4). The Louisiana employment report noted a high percentage of agriculturally-related businesses, 15.3 percent providing agricultural services and 15.3 percent providing farm service (Mondart, p. 15). The Indiana study reported an increase growth of over 3.3 percent between 1972 and 1976 and projected a continuing but slowed growth rate of 3.2 percent from 1976 to 1981 (Legacy, pp. 44-45).

One of the most promising employment areas is the agricultural chemical and fertilizer field. Employment opportunities for both entry-level and upper level positions appear to be as favorable today and they were ten years ago when the field became truly active. A demand for individuals with specilized knowledge is anticipated within five to ten years as this field becomes increasingly sophisticated (Burling Interview). The feed and grain area presents a less favorable picture. Entry-level positions will present a poor opportunity, but the outlook is more promising in the upper level positions, especially for those with managerial skills and experience (Hoeman, Interview). The Bureau projects that the employment opportunity for the wholesale buyer-shipper of farm products is favorable. This feed and grain related occupation is expected to gain 225 additional workers between 1976 and 1982 (Occupational Outlook, 1980, p. 102).

Occupations in other service areas vary in opportunity. Currently there are 450 farriers and ten apprentices registered in Illinois (Parkinson, Interview). No projections exist for this occupation, but the active horse industry will require the farrier's services, and it would be reasonable to expect a continuing market for this occupation. It would be doubtful, however, given a stable horse population, that unusual growth could be expected. Current projections for veterinarians predict only seventeen openings available every year between 1976 and 1982. The openings are due to vacancy, not growth. Although 166 more veterinarians were employed in 1974 than in 1970, the projections for 1976-1982 show that five fewer veterinarians will be employed in 1982 than were in practice in 1970. The 1985 projections endorse the downward trend (Occupational Outlook, 1980, pp. 904 and

101). The field appears to be stabilized at the present time. It is also projected that there will be fewer auctioneers employed in 1982 than were employed in 1976. The same trend is projected for the period 1976-1985. While auctioneers had twenty-one job openings annually between 1970-1974 due to vacancy, the projected number of openings between 1976-1982 is expected to decline. (Occupational Outlook, 1980, pp. 102-103). The demand for college-trained persons with background and training in farm management appears to be excellent. The outlook for animal caretakers appears to be more encouraging for the urban areas. The growth in number of pet shops and increased need for these persons present an employment market that requires not only individuals to replace those who leave the field but new openings due to growth.

AGRICULTURAL MECHANICS

Agricultural mechanics deals with all aspects of machinery, tools, power and equipment necessary to produce plants and animals. Also included in the taxonomy are structures and conveniences and the management of soil and water for farming. Individuals desiring to work within this area should possess mechanical aptitudes.

The field of agricultural mechanics is active both in Illinois and throughout the United States. As the amount of farm equipment increases, so will the need for qualified personnel to care for it. The amount spent in the United States for farm machinery is staggering, $10.8 billion in 1978 or 9.4 percent of total farm expenditures for that year. This showed an increase from 1977 when $8.6 billion was spent or 8.8 percent of the total farm expenditures (Illinois Farm Report, IFA-

80-04). Illinois' farmers spent their share, ranking second in the U.S. in 1974 in the total value of machinery and equipment in place on farms, a dollar value estimated at $3.2 billion. (1974 Census of Agriculture, Vol. IV, Pt. 2, p. 28).

There is considerable manufacturing and wholesale trade activity surrounding farm machinery and equipment in Illinois. In 1977, there were 120 firms producing farm machinery and equipment employing 23,800 employees. This was an increase from 1972 when 20,300 employees were working. Another indication of activity in this area is that the value added by manufacture more than doubled during that time, growing from $458.1 million in 1972 to $1,012.3 billion in 1977 (1977 Census of Manufactures, Preliminary Report, Illinois). Value added by manufacture is a term used by the U.S. Bureau of the Census to indicate a measure of manufacturing activity. It is considered to be the best measure available to determine value when attempting to compare relative economic importance of manufacturing among industries (1972 Census of Manufacturers, Vol. III, Pt. 1, p. xxviii).

Employment Outlook

The employment prospects for agricultural mechanics are favorable, especially for those interested in farm implement repair. There appears to be accelerated activity in Illinois in this area which can be seen from the considerable increase in receipts from 1972 to 1977. During this period receipts rose from over $2.7 million in 1972 to over $7 million in 1977. The number of employees also rose from two per establishment in 1972 to three in 1977 (1977 Census of Selected Service Industries, p. 14-4 and 14-8).

A number of employment studies have reported a favorable employment trend in agricultural mechanics. The Indiana study reported a 4 percent increase in employment between 1972 and 1976. It was anticipated that the trend would continue, but at a slower rate, 3 percent through 1981. A Michigan study anticipated a 14.21 percent annual turnover as well as a need for a 59 percent increase by 1979 in workers with agricultural mechanics skills, while Mondart reported in his Louisiana study that there was rapid growth in this area (Legacy, p. 33; Thuemel, p. 39; Mondart, p. 16).

Projections made by the Illinois Bureau of Labor Security are in agreement with the reports made by Indiana, Michigan and Louisiana, at least for the farm equipment repair occupations. Projections of total employment of farm implement mechanics made in 1978 show an increase of numbers from 2,686 in 1970 to 3,556 in 1974 to 4,527 in 1985 (Occupational Outlook, 1975, p. 60). A review of other figures produced by the Bureau show that like the Indiana study, a slowdown was anticipated. The actual number of job openings for this occupations was 301 per year between 1970-1974 (Ibid., p. 70). The newest 1980 projection states that the number of job openings for farm implement mechanics between 1976-1985 will be 240 annually. Continued growth is anticipated. The Bureau predicts that there will be 864 more jobs in 1985 than there were in 1975 (Occupational Outlook, 1980, p. 94 and p. 105). Greater demand is anticipated for mechanics who specialize in diesel, hydraulic and electrical systems as machinery continues to become more sophisticated.

Little information was available on other occupations within this taxonomy. It would be reasonable to assume that the employment outlook would remain favorable as long as the farming situation in Illinois continues as it is, highly mechanized and highly productive. Because farm machinery is becoming increasingly sophisticated, additional training beyond high school is highly recommended.

AGRICULTURAL PRODUCTS

This taxonomy is concerned with the inspection, sorting, grading storing and processing of agricultural products. Included in this area are food products such as meat, milk, cheese, fruit, grain and oilseeds as well as nonfood products such as wool, wood and cotton. Ice cream, cheese, butter, soybean oil, dog food, flour and particle board are examples of products produced within this category. In Illinois, wood is the primary nonfood items processed, and it will be discussed under the Forestry taxonomy.

The industries making up this taxonomy are treated within groupings in the review of production and employment that follows. The groupings are: meat and poultry; dairy products; processed fruits and vegetables; bakery goods and confectionary products; grain mill and feed products; and soybean and cooking oil. No attempt has been made to examine every industry within the taxonomy. Rather, a number have been selected for study, and the information derived from the review will be considered applicable to the agricultural production taxonomy as a whole. Unless otherwise noted, the information for the following section was taken from the 1972 and 1977 Census of Manufactures, and the Illinois Bureau of Employment Security.

Meat and Poultry

The value of products produced in this area increased from 1972 to 1977, but the number of employees decreased. Illinois was among the top four states in employees in sausage and other prepared meats with ninety-nine firms employing 7.200 workers in 1977, a decrease from 7,900 in 1972. Workers in poultry and egg processing remained stable with six hundred. Value added by manufacture increased from $161.6 million in 1972 to $247.3 million in 1977 in sausage and other prepared meats; $167.0 million to $133.2 million for the same period in meat packing; and $9.3 million from $6.5 million for poultry and egg processing.

Dairy Products

The 1977 Census of Manufactures preliminary report did not provide figures for Illinois dairy production. In 1972, however, 187 establishments hired 9.200 employees. The value added by manufacture was $236.2 million. Employment prospects in this industry are not promising. Increasing mechanization is replacing workers, especially in the areas of packing and handling. A report published by the U.S. Department of Labor expected an employment rate decline of about 2.7 percent annually. The report also noted that remaining jobs will be increasingly complex and require more extensive training (Dairy Products Industry, pp. 11-12).

Processed Fruits and Vegetables

Illinois is one of the leading states in employing workers in frozen specialities and pickles, sauces and salad dressing. Even so, the number of workers decreased between 1972 and 1977 in frozen specialties, 4,100 to 2,900, and in canned fruits and vegetables 2,400 to 1,600 in the same period. The value of canned fruits and vegetables between 1972 and 1977, declined, but it rose dramatically for pickles, sauces and salad dressing, showing an increase from $24.7 million in value added by manufacture in 1972 to $252.9 million in 1977. The employment outlook for this segment of agricultural prodessing is not outstanding. It would appear that jobs will become available primarily through vacancy.

Bakery Goods and Confectionary Products

For the industries reviewed in this category, bread, cakes and related products, cookies and crackers and confectionary products, a decline in the number of employees is apparent. Breads and cookies both lost jobs, but candy gained employees. All operations gained in value. Between 1972 and 1977 bread rose from $237.0 million in value added by manufacture to $320.6 million; cookies rose from $193.3 million to $271.9 million; while confectionary products rose from $352.5 million in 1972 to $563.6 million in 1977. It should be noted that Illinois is one of the top employers in the cookies and candy industries in the U.S. The fact that the number of jobs is declining here is an indication that the employment outlook is not promising, although it should be noted that openings probably will be available due to job vacancy.

Grain Mill and Feed Products

The employment picture for this category follows the predicted trend for Illinois. The number of workers is declining while the value of production increases. Illinois was the leading state in employment for flour and other grain mill products and for dog, cat and other pet food, but experienced an employment shift away from prepared feed between 1972 and 1977. Total value added by manufacture between 1972 and 1977 was as follows: Flour and other grain mill products, $53.0 million to $84.4 million; dog, cat and other pet food, $125.8 million to $189.1 million; and Prepared Feeds $111.0 million to $184.8 million. As with the other industries reviewed, the employment outlook is not favorable. Again, it is logical to assume that any openings would be due more to vacancy, considering the continuing effect of mechanization.

Soybean Oil and Cooking Oil

This industry departs from the employment trend to show a slight increase in the number of workers between 1972 to 1977. Soybean oil mills employed between 1,000-2,499 workers in 1972 and 2,600 in 1977, while the shortening and cooking oil firms employed 1,900 in 1972 and 2,000 in 1977. Value added by manufacture also rose for shortening and cooking oil from $90.8 million in 1972 to $94.6 in 1977. Comparative data are not available for soybean oil. Because of the increase in number of employees indicating continued growth of this area, the prospects for employment would appear to be favorable. As of the 1977 census, Illinois led both areas in employment throughout the United States.

Employment Outlook

The Illinois Bureau of Employment Security projects factory employment to increase by 1985 to 1.4 million workers. It is anticipated that the expansion will take place at a faster rate in those industries producing durable goods, while slower growth is anticipated in the non-durable areas. Increased mechanization will affect the employment picture, replacing workers with increasingly sophisticated machines (Occupational Outlook, 1978, p. 7). The effect of new machinery replacing workers was noted in the discussion of dairy products.

The following review of employment prospects of four occupations within agricultural products does not enable one to draw hard conclusions about future employment for the entire taxonomy. However, it does illustrate that openings will be available, even for those occupations which are showing negative growth.

Opportunities for meat cutters in manufacturing are favorable, which goes against the decline in employment shown for the meat products industry as a whole. The Bureau shows 155 projected openings each year through 1982. Openings for millers are expected to be stable with thirty-seven jobs a year available through 1982 and thirty-eight available annually in the period between 1976-1985 (Occupational Outlook, 1980, pp. 95-96). This shows a recovery from the 1970-1974 period when slight negative growth was experienced. Again, the increase, although slight, is not typical of the decreased employment shown in the flour and grain milling industry.

Two occupations show openings each year, but the jobs as a whole are losing workers. There will be 252 jobs each year for bakers, but at the same time forty-six opportunities will be lost annually. Openings are due to replacement, not to growth of opportunity. Graders and sorters in manufacturing will need only thirty-one workers each year due to replacement (Ibid., pp. 98-96).

Job opportunities do exist in the agricultural products taxonomy. Mechanization is reducing the number of opportunities, however, and many job openings are created by replacement need alone. As long as the industries themselves remain viable, however, a certain number of employment opportunities will exist. It is recommended that more study be given to this taxonomy to identify those occupations requiring agricultural competencies.

ORNAMENTAL HORTICULTURE

This taxonomy is concerned with the production of plants used principally for ornamental and aesthetic purposes, including establishing, maintaining and managing ornamental horticulture enterprises. Activities contained in this taxonomy include arboricuture, floriculture, greenhouse operation and management, landscaping, nursery operation and management, turf management and other skills associated with ornamental horticulture production. For the purposes of this report nursery and greenhouse operations are treated in the ornamental horticulture taxonomy rather than within agricultural production where it is sometimes placed.

Ornamental horticulture is a very active, growing field. Its growth is obvious when examining nursery activities, service areas such as landscaping or lawn care services and florist and garden retail shops. The majority of ornamental horticulture businesses are concentrated in the urban centers. In Illinois, for example, the majority of florist establishments are located in the urban areas. There are 1,459 in the Chicago and Chicago-Gary, Indiana area alone. Retail nurseries and lawn and garden supply stores also reflect this trend with 484 located in the Chicago area and 127 spread throughout other urban centers. (1977 Census of Retail Trade, p. 14-13). The urban character of this taxonomy is also noted in the Occupational Outlook Handbook when it notes that landscape architects and floral designers are both centered in metropolitan or urban and suburban areas (Handbook, p. 582; p. 587). Florist shops and garden and supply centers are found in small towns, but the primary concentration is urban.

As was noted above, a number of activities make up ornamental horticulture. One of the fundamental areas is nursery and greenhouse production. Growth is characteristic of this area as it is of the others. This is true both on a national level as well as in Illinois. In 1969 there were 18,023 farms producing nursery products throughout the United States. By 1974, the number had risen to 23,942. Similar growth took place in those farms producing cut flowers and related florist plants. The number of farms increased from 8,191 to 11,829 between 1969 to 1974. (1974 Census of Agriculture, Vol. II, Pt. 6, p. 27). Similar increases are reflected nationally for all nursery and greenhouse production for that period. Illinois followed the national trend during the 1969-1974 period with the number of farms providing nursery and greenhouse products increasing from 552 in 1969 to 706 in 1974. (Ibid., p. 157). The 1977 Census of Retail Trade traces the continued national growth of nurseries (retail) and lawn and garden supply stores. In the U.S., the number of establishments increased from 8,131 in 1972 to 15,487 in 1977. Illinois again followed suit, the number of establishments growing from 353 in 1972 to 553 in 1977 throughout the state. Sales also grew dramatically in Illinois moving up from $35 million in 1972 to over $83 million in 1977. (1977 Census of Retail Trade, Illinois, p. 52-25; p. 14-9).

Florists are also showing growth, but at a slower rate than retail nurseries and garden supply stores. Throughout the U.S. the number of florists grew from 24,464 in 1972 to 29,375 in 1977. Within Illinois the number of florists grew from 1,191 to 1,329 between 1972 to 1977, while sales rose from around $103 million to over $146 million during this period (1977 Census of Retail Trade, p. 52; p. 14-9).

In 1974, there were 33,618 landscape and horticulture service establishments in the United States with total gross receipts of $1.5 billion and an annual payroll of $494.8 million. Around 60,000 paid employees worked 150 days or more in 1974, while 85,941 employees worked less than 150 days. Of the three categories making up the landscape and horticulture service area, lawn and garden services is the largest, with 24,940 establishments reported nationally in 1974, followed by 7,118 ornamental shrub and tree service and 1,560 landscape counseling and planning firms (1974 Census of Agriculture, Vol. III, p. 1). Illinois again followed the national pattern. Of 1,030 landscape and horticultural service firms within the state, lawn and garden service firms dominated with a total of 661, followed by 315 ornamental shrubs establishments and fifty-four landscape and planning businesses. Gross receipts for all firms totaled $58.1 million (1974 Census of Agriculture, Vol. III, pp. 27-29). Because figures are not yet available from the most current agricultural census, it is not possible to estimate the amount of growth that has taken place in this area against similar data. The Indiana employment study discovered a significant growth in this area, the number of Indiana landscape and horticulture service firms increasing from 196 in 1972 to 325 in 1976. The study projected further growth to reach 409 in 1981. The Indiana study demonstrated growth in all areas of ornamental horticulture for the same period, although other areas grew at a much slower rate between 1972 and 1976 (Legacy, p. 68).

Employment Outlook

The employment outlook for ornamental horticulture appears to good due to its steady, sometimes impressive, growth over the last decade. The 1977 Census of Retail Trade shows a small increase in the number of employees hired per establishment for retail nurseries and lawn and garden supply stores and florists. Retail nurseries and lawn and garden supply stores hired four persons per establishment in 1972; by 1977, the number had increased to five. Florists increased the number of employees during the same period from five to six per establishment. A rough estimate of the number of persons working for Illinois florists can be made by multiplying the number of firms by the average number of employees. This method shows that approximately 5,955 people were employed by florists in 1972 and 7,974 in 1974 (1,191 firms times five employees; 1,329 firms times six employees, respectively). Apply this rough method to retail nurseries and lawn and garden supply stores and the result will be approximately 1,412 individuals employed in 1972 (353 establishments time four employees) and 2,765 in 1977 (553 establishments times five employees). The prospects are not glowing, but growth will present opportunities for those who want to enter the field (1977 Census of Retail Trade, p. 14-11).

The Illinois Bureau of Employment Security projected the employment prospects for gardeners and groundskeepers, other than farms to be favorable. In 1970, there were 17,518 workers in this category and 19,463 in 1974. Projections made in 1978 anticipated that the number employed in 1985 would be 20,502 (Occupational Outlook, 1978 p. 64). In 1978, employment for this group was expected to grow more slowly than average, but job prospects were good because of the many part and full-time openings (Occupational Outlook, p. 37). The new projections prepared in 1980 sustain this trend. Change in employment between 1976 and 1985 predict that 851 more workers will be employed in 1985 than in 1976, an annual average of ninety-five positions. It is also anticipated that 1,260 openings annually will be available due to growth and vacancy (Occupational Outlook, 1980, p. 98; p. 109). The trend of slow growth in ornamental horticulture is supported by the Indiana manpower study. The study noted an increase of employees per business as growing from 5.52 in 1972 to 6.0 in 1976. The projection for 1981 was a modest 6.30 (Legacy, p. 68).

RENEWABLE NATURAL RESOURCES

Renewable Natural Resources is concerned with the conservation, propagation and utilization of natural resources such as soil, water, air, wildlife, forests, plants and fish for both economic and recreational purposes. Pollution, including water, air and noise, protection of wildlife, soil erosion and retention, propagation of fish and the creation and management of natural recreational resources are activities contained within this taxonomy. The taxonomy falls naturally within the agricultural sphere because the concern is to keep the natural environment viable which in turn guarantees continued, fruitful agricultural production.

Several factors characterize this taxonomy. First, the majority of those working in this area work for some level of government, federal, state or local. Woods' study showed that 51.3 percent of four-year Illinois graduates in natural resources were placed in government work (Woods, p. 69). The Occupational Outlook Handbook reported that of the 3,000 range managers employed in the United States in 1976, the majority were working for the federal government. The Handbook went on to state that that the majority of the 85,000 park, recreation and leisure service workers employed throughout the United States that same year were working for public, tax supported agencies (Handbook, p. 337; p. 558).

Another characteristic of this taxonomy is that many of the jobs are located in urban areas. For example, in 1977, 10,840 individuals in Illinois were employed by state and local governments in park and recreation. Of that number, 10,039 were located in SMSA's (1977 Census of Governments, Vol. 3, No. 2, p. 46). Finally, the need for education beyond the high school level appears to be crucial for those who wish to make a career in many areas of renewable natural resources. The Occupational Outlook Handbook notes that conservationists normally require specialized training. Foresters, range managers and soil conservationists require bachelor degrees, and forestry technicians should possess technical school training (Handbook, p. 334). The following examination of the employment outlook in renewable natural resources is broken down into four areas: conservation, including pollution control;

1parks and recreation; private recreation; and water treatment and sanitation.

Conservation

Employment opportunities in conservation are not promising. In October of 1977 there were 4,768 individuals employed by state and local governments in the area of natural resources in Illinois. This was a slight increase of 250 from October of 1972 when 4,518 were on the payrolis. There has been a steady increase of natural resource workers since 1953 when 2,108 were employed. In 1957, the number rose to 2,329, in 1962, there were 3,283 and in 1967, 3,591 (1977 Census of Governments, Vol 6, No. 4, p. 134). This slow rate of growth is expected to continue, at least for foresters and conservationists. The number of average annual job openings has increased slowly from 1970-1974, when there were thirty-three openings a year to 1976 when there were thirty-eight openings a year. The trend is expected to continue through 1985 at thirty-nine openings annually (Occupational Outlook, 1978, p. 76; Occupational Outlook, 1980, p. 91). The study of Indiana's manpower needs also projected a slow growth rate of 1.8 percent between 1976 and 1981 (Legacy, p. 77).

Of the 4,768 workers employed in Illinois government in 1977, the majority, 4,261, were employed by the state government. Only 507 were employed by local governments. Of those employed by local governments, 77.7 percent worked within SMSA's. (1977 Census of Governments, Vol 3, No. 2, p. 46).

Entry-level opportunities exist in conservation. The Illinois Department of Conservation employs about 1,200 people. Approximately

400-450 of them are full-time, permanent, entry-level positions. Opportunity is good because of high turn-over rate created by a promotion-from-within policy at work within the Department. Promotion is limited, however, dependent upon experience and further training. For an individual with a four-year college degree or its equivalent, employment opportunities are also good and are expected to continue to be so for several years because of program expansion. The turnover rate at the bachelor's degree level is also high (Hutchinson, Interview).

Fewer entry level opportunities exist in the environmental protection field. The Illinois Environmental Protection Agency has only three entry-level jobs, two of which require high school diplomas and the third a two-year associate degree (Hardin, Interview). The Federal Environmental Protection Agency offers no entry-level positions. The only way to enter the Region 5 operation (which includes Illinois) is at the clerical level and working one's way up. Few non-professional positions exist, and anyone interested in non-clerical, entry-level work would have to take additional training. The majority of the jobs in the Region 5, Federal Environmental Protection Agency are professional, about 75 percent of the staff. There are between 150-200 engineers, 100 attorneys and seventy-five scientists. There are paraprofessional and support positions as well, but additional education and training is required to be employable (Byrne, Interview). This points up the need for education above the high school level if an individual is interested in a career in conservation.

Parks and Recreation

Employment in Illinois parks and recreation is also not promising, although the number of jobs have increased over the years. In 1977, state and local governments spent over $333 million on parks and recreation, a considerable increase from 1972 when over $174 million was spent (1977 Census of Governments, Vol. 6, No. 4, p. 86). As was noted above Illinois governments hired 10,840 full-time employees in this area in 1977, 10,039 of whom were employed within SMSA's demonstrating an urban emphasis. The Chicago Park District alone employed 4,562 full time workers in 1977 (Ibid., Vol. 3 No. 2, p. 46; No. 1, p. 229). The Occupational Outlook Handbook notes that the field of parks and recreation is expected to grow because of increased interest in physical fitness and recreation. The need for training is stressed because of the competition for full-time employment in this area (Handbook, p. 559). The Handbook further states that the field is characterized by an unusually large number of volunteers, part-time or seasonal jobs. Anyone interested in a permanent, full-time career should obtain as much experience and training as possible to be competitive. (Ibid., p. 558).

Private Recreaton

Private recreation in Illinois has also shown increased activity in recent years providing more job opportunities, especially in the urban areas. There has been limited expansion in the number of trailer parks and camp site operations from 1972 when 309 were operating throughout the state to 1977 when the number had increased to 337. Receipts grew during that period from $6.6 million to $11.4 million. Another growth area was public golf courses, excluding those provided by municipalities. In 1977, 294 public golf courses with a payroll were operating in Illinois with 2,779 paid employees. Receipts increased between 1972 to 1977, from $21.2 million to $34.5 million. A similar increase in these two businesses was projected by the Indiana study (Legacy, p. 79). Horse racing and racing stables are also viable. In 1977, 784 paid employees worked for ten racetrack operations, while 371 workers were hired by eighty-four racing stables. The increased investment and activity in racehorse breeding noted above should contribute to this trend. Sporting and recreational camps saw a decline, dropping from 178 establishments in 1972 to ninety-seven in 1977. Receipts also declined from $5.2 million in 1972 to $3.4 million in 1977 (1977 Census of Selected Service Industries, Illinois, Table 1, pp. 14-9-10).

Water Treatment and Sanitation

As is true of other areas of renewable resources, the employment outlook in water treatment and sanitation is tentative. There has been an increase in the number of jobs over the last several years, but once new water and sanitation systems are established it is doubtful if a significant number of openings will occur each year. There has been an increase in the number of individuals employed by the state and local governments in Illinois to operate local utilites from 18,883 in 1972 to 19,992 in 1977. The amount of money spent by the governments increased as well, from over $257 million in 1972 to over $588 million in 1977 (1977 Census of Governments, Vol. 6, No. 4 p. 134; p. 86). Local governments, primarily municipalities, are the principal employers.

Of the 10,187 employees working in the area of water supply and sanitation other than sewage, none were employed by the state, while 9,960 were employed by municipalities (Ibid., Vol. 3, No. 2, p. 46). Chicago's Metropolitan Sanitary District employed 2,554 full-time employees alone in 1977 (Ibid., Vol. 3, No. 1, p. 229)

Employment Outlook

The employment trend is not favorable in the area of renewable natural resources. Although there is slow growth rate and a number of job openings annually, there is competition for all openings. The Woods' study of Illinois agricultural college graduates reported a surplus of graduates in natural resources graduates in 1978 (Woods, p. 25). Those interested in pursuing a career in this area should plan on obtaining as much training and experience as possible to be competitive.

FORESTRY

Forestry is concerned with the production, protection, management, harvesting and utilization of forest lands and forest products. Recreation, wildlife management and watershed management are also included in the taxonomy, thereby sharing a common bond with the renewable natural resource area. In Illinois, there are about 3.6 million acres of forest comprising almost ten percent of the state. Illinois is not a major forest producing state, however.

Forestry activities fall primarily into two areas, resource management and industry. In Illinois, resource management is concerned with recreation, wildlife and watershed management and open space as well as protection and management of forests, both public and private. The

Division of Forestry, part of the Illinois Department of Conservation, employs about fifty professional foresters. Other sources of employment are the Federal government at Shawnee National Forest, counties and cities. Cook county's forest preserve system is extensive, for example, containing around 30,000 acres.

The industrial area of forestry can be divided into two parts, the primary wood using industries and the secondary wood using industries. Sawmills, pulp and paper plants, composite wood firms and establishments manufacturing veneer and plywood comprise the primary area, while the secondary area is made up of those activities which take the material produced by the primary industries and make wood based products. Illinois is the fourth most important state nationally in the secondary wood using industry. Because Illinois is not a large timber producer, much of the raw material must be imported for manufacturing purposes (Holland, Personal Interview).

A survey of a few activities in the primary and secondary wood using industries should indicate their scope with the state. In 1972, there were 575 establishments in the area of lumber and wood products which employed around 12,900 people and registered a sum of $179.6 million in value added by manufacturing. Within this category 110 sawmills and planning mills employed 700 people in 1972 and produced a value added by manufacture of $7.2 million. By 1977, the number of mills had decreased from 110 to 86, but an increase in value added by manufacture rose to $12,8 million. (1977 Census of Manufactures, Preliminary Report; 1972 Census of Manufactures, Vol. III, Table 5, p. 14-12). In the wholesale area 329 wholesale establishments sold over

$538 million worth of lumber, plywood and millwork in 1972. The products were produced by 3,473 paid employees (1972 Census of Wholesale Trade, Vol. II, p. 14-5). Between 1972 and 1977 the number of paperboard mills dropped from twelve to nine, and the number of employees followed, decreasing in number from 1,800 to 1,400. The value added by manufacture increased slightly, rising from $34.4 million in 1972 to $44.7 million in 1977. (1972 Census of Manufactures, Vol. III, p. 14-12; 1977 Census of Manufactures, Preliminary Report).

In the secondary wood-using industries category thirty-nine firms manufactured wood containers in Illinois in 1972 employing 1,000 people; seventeen firms hired another thousand to produce prefabricated wood buildings; and partitions and fixtures were made by 2,600 people working in 101 firms creating a total inventory of $37.5 million in value added in 1972. (1972 Census of Manufactures, Vol. III, P. 14-12). While these figures do not provide a definitive picture of forestry manufacturing activity, they do illustrate that the field is an active one.

Employment Outlook

The employment picture is not favorable in forestry because of competition for openings in the resource management area and a decline in employment in the industrial area. A surplus of forestry workers is creating competition in resource management. Foresters may encounter difficulties in finding work as more earn four-year degrees than there are available jobs. The Woods study reported a surplus of forestry graduates in Illinois every year between 1975 and 1978, and the Occupational Outlook Handbook noted the same occurrence on a national scale

(Woods, p. 28; Handbook, p. 335). The number of openings is expected to grow, but the number of qualified applicants is expected to exceed opportunities. Competition is also anticipated at the forestry technician level, although growth in the number of openings is expected in this occupation as well. If an individual wishes to be competitive at the technician level it is highly recommended that the one or two years of specialized study normally required for job entry be completed (Handbook, p. 336). It should be noted that about half of the nation's forestry technicians worked for private companies, i.e. logging, lumber or paper; in 1976, while the remaining half worked for state and federal governments. The fifty-fifty hiring split between government and private industry also exists in Illinois (Holland, Personal Interview). It is also anticipated that the private sector will provide more jobs for foresters in the future than will state governments (Handbook, pp. 335-337).

Job vacancies are becoming more scarce in the production and industrial portion of forestry. Entry level workers seeking employment in logging or lumber mills may experience difficulty in locating a job as mechanization become more common and continues to replace workers (Ibid., p. 676). In Illinois, logging and lumber inspectors declined from seventy-four to sixty-seven between 1970 and 1974 (Occupational Outlook, 1978, p. 60), a decline which is predicted to continue as only one opening a year is anticipated annually through 1985 (Occupational Outlook, 1980, p. 95). The number of timbercutter and logging worker openings are decreasing even more rapidly. A loss of 105 jobs was reported between 1970 and 1974 (Occupational Outlook, 1978, p. 84). While the decline has slowed, the annual loss is predicted to continue through 1985 at fifteen positions a year (Occupational Outlook, 1980, p. 109). The sawyer also registered a decline in employment between 1970 and 1974 to 3,250 (Occupational Outlook, 1978, p. 62). However, the most recent projection predicts that employment will increase in this occupation requiring 131 sawyers annually for the period between 1976-1985 (Occupational Outlook, 1980, p. 97). This coincides with the stable employment situation shown in sawmills and planing mills between 1972 and 1977 when no positions were lost in this period in Illinois. The secondary wood-using industries appear to be either stable or following the trend of decreased number of job openings due to mechanization reflected in the Agricultural Products taxonomy. As was noted above, sawmills and wood container firms remained stable in employment numbers, but paperboard mills decreased the number of employees by 400 between 1972 and 1977. As was the case with the other taxonomies it should be remembered that jobs will become vacant due to attrition of employees.

SUMMARY OF EMPLOYMENT TRENDS IN ILLINOIS AGRICULTURE

Impending political and energy-related problems and other unforeseen factors may change the outlook presented in this review of employment and economic activity throughout Illinois agriculture. For example, high interest rates in early 1980 and the high cost fuel and petro-chemical products have put some farmers in a precarious position. Also, petroleum shortages and expensive fuel have showed their effect through a new and expanding gasohol industry. Therefore the future cannot be accurately predicted, but the trends described herein should help in planning educational programs that will reflect employment trends in agriculture and agribusiness over the next decade.

The following section is a summary of employment trends in Illinois agriculture identified by this report. The summary is divided into two parts. The first portion discusses the number of workers employed in each taxonomy, while the second identifies the employment outlook for each area. It was not possible to identify the exact number of workers employed in Illinois agriculture by reviewing the sources noted earlier in this report. With the exception of farm owners and workers and the food processing categories, information was available for only a few occupations. As a result of this lack of data, the estimation of the number employed in the seven taxonomic areas within Illinois Agriculture are incomplete and in most cases fall below the actual figure. Even so, the numbers should be helpful in suggesting the general magnitude of agricultural employment in Illinois.

NUMBERS EMPLOYED

1. Agricultural Production - 198,000 Workers

This figure was compiled by the Illinois Cooperative Crop Reporting Service and represents the number of workers employed in October of 1979. Agricultural Production remains the primary employer of agricultural workers in Illinois.

2. Agricultural Supplies and Services - 57,000 Workers

The figure was derived from Bureau statistics, Census data and telephone interviews with members of agriculture business associations and the Illinois Department of Conservation. It does not include custom farm workers or all fertilizer and grain handling workers which are a major component of this sector. Therefore, these figures substantially underestimate the magnitude of employment in this area.

3. Agricultural Mechanics - 27,500 Workers

Only workers engaged in manufacture of farm and garden machinery and farm implement repairers (3,500) are included in this figure. Other worker categories such as farm electricians, agricultural equipment installers, grain bin and farm building construction workers, are not included. The numbers in this taxonomy also appear to be substantially understated.

4. Agricultural Products - 116,000 Workers

The Illinois Bureau of Employment Security identified the number of workers in Food and Kindred Products stated above. It should be noted that many of the jobs in this category do not require traditional agricultural skills.

5. Ornamental Horticulture - 30,000 Workers

The above figure is also understated and not indicative of the overall employment situation in this active area. Figures for florists, retail nurseries, lawn and garden establishments, supply stores and groundskeepers are included. Employment data for wholesale operations, and tree and lawn services were not available. There is also considerable seasonal employment not reflected here. The stated figure was derived from information provided by the Census and the Illinois Bureau of Employment Security.

6. Renewable Natural Resources - 30,000 Workers

The figure represents workers in public parks and recreation, conservation, private recreation and water supply and sanitation. The information was obtained from the Census and by telephone interviews with the Illinois Department of Conservation and the state and Federal Environmental Protection Agencies.

7. Forestry - 16,300 Workers

The figure above was derived from information provided by the Illinois Bureau of Employment Security. It represents employment for timbercutters, logging workers, sawyers and the lumber and wood products industry. The majority of workers (11,800) included in this taxonomy are employed in this latter category.

EMPLOYMENT TRENDS

1. Agricultural Production

The employment outlook can be considered fair in this taxonomy in spite of the disagreement as to the unemployment activity. The number of farmers are expected to decrease due to the continued decline in numbers of farms, i.e., a loss of 4,000 between 1978 and 1980. The number of farm workers as a whole is predicted to decline by the Illinois Bureau of Employment Security by 3,000 annually through 1985, while the Illinois Cooperative Crop Reporting Service recorded an increased number of farm workers from 189,000 in October 1975 to 198,000 in October of 1979. This increase is supported by a similar trend in Indiana and Michigan. Although the outlook is not promising in all areas of agricultural production, the decline does not appear to be as severe as predicted nationally.

2. Agricultural Supplies and Services

This field is very viable economically, but not all areas offer favorable employment, especially at the entry level. The agricultural chemical and fertilizer business is expected to offer excellent opportunities at entry and mid-level. The outlook is also favorable in the soil service area as there is a history of expansion and as fewer people own larger farms. Jobs in pet shops and openings for animal caretakers requiring low-level skills are good in urban areas. The veterinary field offers few openings, especially for professionals. Those interested in the feed and grain business can expect few entry-level openings, but managerial opportunities are good. The farrier outlook appears to be stable, but auctioneers may experience difficulty in locating employment. At present there is a strong demand for persons with farm background and college training in farm management.

3. Agricultural Mechanics

Employment outlook remains extremely good for farm implement repairers, expecially those with expertise in diesel, hydraulic, and electrical systems. Additional training is recommended for those who wish to advance in this field, especially as the machinery continues to become more intricate and sophisticated. Information on other occupations is not available from data reviewed for this study.

4. Agricultural Products

Although Illinois is a leading employer in food and food products processing, the number of employees are declining each year because of increased mechanization. Employment opportunities for meat cutters in manufacturing and for millers are favorable, but bakers and sorters and graders in manufacturing are declining. Job openings for the latter are projected to occur, however, 250 every year for bakers and thirty-one a year for sorters and graders. Most of the jobs are located in urban areas.

5. Ornamental Horticulture

The employment outlook is very good because of the continued growth in this area. Favorable job projections have been made for gardener and groundskeepers, both full and part-time, floral designers and landscape architects. Lawn service operations are especially active, and florists, retail nurseries and lawn and garden supply stores all appear to offer good opportunities through 1985. Most jobs will be located in the urban areas.

6. Renewable Natural Resources

The various areas of this taxonomy, conservation, environmental protection, parks and recreation, private recreation and water treatment and sanitation, all show signs of modest growth in the near future. Although job openings are anticipated, there will be competition in certain areas which will make employment difficult, i.e. conservation, environmental protection, and parks and recreation. The primary employer in this taxonomy is the government: federal, state and local. Conservation and parts of public recreation excepted, there is heavy urban employment. Between 400-450 entry-level jobs are available each year with the Illinois Department of Conservation, but those seeking employment should expect competition. Additional training beyond the high school diploma is highly recommended for those interested in careers in these areas.

7. Forestry

The employment prospects in Illinois forestry are not outstanding. In the area of resource management, the outlook is basically the same as conservation. Some entry-level jobs exist, but there is competition for each position. In the private sector, the wood growing and wood-using industries do not offer many annual openings. There are only 11 openings annually predicted for timbercutters and one a year for logging and lumber inspectors. The primary wood-using industry opportunities appear to be better with 131 openings annually predicted for sawyers. The secondary wood-using industry is important in Illinois, but employment is declining as in other areas of processing.

As a whole, the employment outlook is good for the agricultural industry especially for the areas of agricultural supply and service, agricultural mechanics and ornamental horticulture. Urban related agricultural employment appears to be very promising showing continued growth. Figures showing projected national employment in agriculture and agribusiness for the period between 1970 and 1980 produced by the U.S. Department of Labor and the U.S. Bureau of Labor Security show an increase of 5.5 percent. The Illinois employment would appear to fall into line with that estimate.

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COMMON COMPETENCIES IN ILLINOIS AGRICULTURAL OCCUPATIONS

This chapter identifies the common comptentencies needed by those planning to enter occupations in Illinois agriculture at entry or mid-management level. The review of common competencies is one part of the information gathered for the use of those participating in preparing the new core curriculum in vocational agriculture for Illinois secondary schools. It should also be helpful for teachers of vocational agriculture in preparing their teaching programs. In addition to the competencies, the chapter also contains a listing of occupations relevant to Illinois agriculture.

Because the Core Curriculum Project treats rural and metropolitan agriculture separately, the information is presented in two parts, i.e. those competencies and occupations common to the rural area, identified as RAP - Rural Agriculture Program, and those normally found in the urban area, identified as MAP - Metropolitan Agriculture Program. Within these two major divisions, the competencies and occupations are sorted out according to the taxonomic areas identified by the Office of Education, U.S. Department of Health, Education and Welfare discussed in the previous section. The taxonomic areas are:

.01 - Agricultural Production
.02 - Agricultural Supplies & Services
.03 - Agricultural Mechanics
.04 - Agricultural Products
.05 - Ornamental Horticulture
.06 - Renewable Natural Resources
.07 - Forestry

In the pages that follow an explanation of how the occupations and competencies were derived is presented, and listings of the occupations and competencies are provided for those using this chapter. All competencies recorded for the study are given, in addition to those identified as common, so that the true scope and variety of skills required in the agricultural area are adequately illustrated.

METHODOLOGY

OCCUPATION IDENTIFICATION

The identification of competencies common to each taxonomic area noted above fell basically into three stages, the identification of agricultural occupations, the identification of individual competencies and the analysis of common competencies. Because one of the purposes of the core curriculum is to prepare high school students for entry into the world of work, it was decided to derive the common competencies from occupations at the entry-level in Illinois agriculture. Two occupational listings were prepared, one for RAP and one for MAP, following the direction of the advisory committees. The RAP advisory committee indicated that both entry and mid-level occupations be reviewed, while the MAP advisory committee decided initially to limit the occupations to entry-level only. Mid-management level occupations were ultimately included, however.

The occupations were chosen by each group in a different manner. For the rural committee, the project staff made up a preliminary occupations list using the Dictionary of Occupational Titles, the National Ag Occupations Competency Study and information from various curriculum guides. Recommendations from the senior project staff members were also sought. Various advisory committee members were contacted by phone when the list was completed so they could review, comment and approve the list. The metropolitan group chose their occupations from the National Ag Occupations Competency Study. A tally was made of the occupations chosen by the committee, and those considered by over half of the committee members to be important were made part of the final list.

The occupations for the rural area, the metropolitan area and those chosen by both advisory committees are listed on the following pages. As can be seen by the listings, each occupation is preceded by a four-digit number. The first two digits represent the taxonomy to which it belongs, while the second set is the number given to the occupation in the list. Each occupation was coded in this manner to facilitate the sorting of the competencies.

IDENTIFICATION OF INDIVIDUAL COMPETENCY

Once the list of occupations had been finalized, it was necessary to choose a method to identify the competencies common to the various taxonomies. A number of alternatives presented themselves.

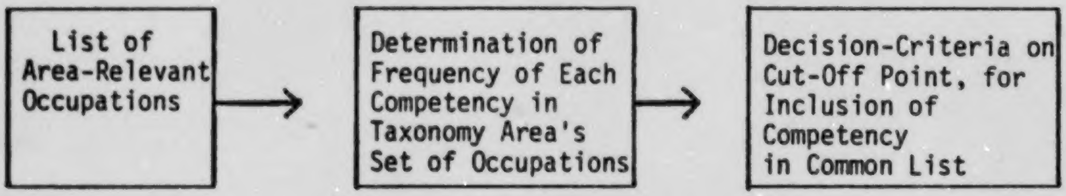
Alternatives

1. Undertake a rigorous task-analysis approach. Using this approach, the jobs performed by a sample of persons employed in each of the occupations identified could be studied through observation, interview and questionnaire responses. This would lead to a competency list for each occupation from which competencies common to all such lists could be identified.
2. Create a list of competencies based on the experience of agriculture teachers, employers and professionals. Such a list could

be subjected to a pilot trial on a few, typically diverse set of occupations to refine the list. A survey could then be conducted for determining the frequency of relevance of each competency to the occupations in the rural and metropolitan areas of the state.

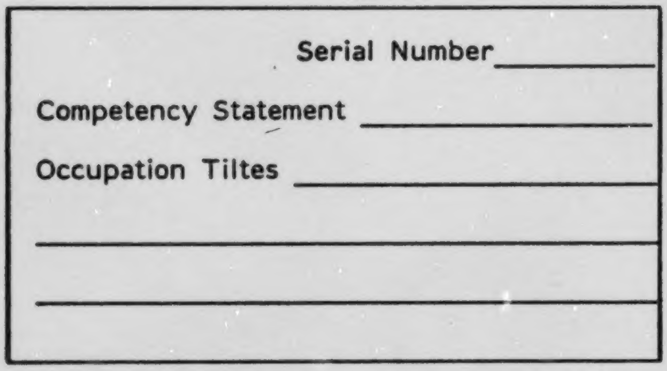
3. Review existing national and state-level competency studies and job descriptions. Identify common competencies by analyzing these studies.

It was decided to use alternative three, the review and analysis of existing studies. The choice was made for several reasons. First of all, the purpose of the common competencies list was to aid in the development of the core curriculum, not to create specialized courses in agriculture. A rigorous task analysis approach which would be appropriate for developing programs for specialized and specific occupations would be too demanding in terms of resource needs--time, personnel and funds--in the context of the development of a core curriculum. Utilizing alternative two, the identification and testing of competencies through teachers, employers and professionals, would also use more resources than were available. Using available, comparatively recent studies like the National Ag Competency Study and current information like the Dictionary of Occupational Titles, would save time and resources in comparison with the first two alterantives discussed above. The model shown below was adopted to pursue the study.


List of Area-Relevant Occupations
Determination of Frequency of Each Competency in Taxonomy Area's Set of Occupations
Decision-Criteria on Cut-Off Point, for Inclusion of Competency in Common List

Procedure

1. Each occupation was reviewed using the *National Ag Competency Study* and/or the *Dictionary of Occupational Titles*. Competencies were scanned, identified and recorded. It was found that the competency statements pertaining to each occupation differed considerably in specificity. Also, in some cases, the competency statements tended to be topic oriented rather than performance oriented. Therefore, it sometimes became necessary to create a general statement which would include or stand for related, specific statements. The decision as to which competency statements to include was made on the basis of frequency and considered judgment.
2. Once a competency statement was identified, it was entered on a card, using one card per competency statement. The occupation title was then entered on the card. When, subsequently, another occupation in which the same competency was included was identified, the additional occupation title was added to the appropriate competency card. When all competency statements were identified, each was assigned a serial number. The format of the card is shown below.



Serial Number ___________

Competency Statement ___________

Occupation Tiltes ___________

ANALYSIS OF COMMON COMPETENCY

When every occupation for the RAP and MAP had been reviewed for competency statements, it was possible to begin an analysis of all competencies to identify those that were common to each taxonomic area and to the RAP and MAP areas as a whole.

Procedure

1. After reviewing all occupations, the data on the cards was abstracted, RAP and MAP being treated separately.

   The abstract gave the following details:

Serial No.	Competency Statement	Taxonomic List of Occupations in which Competency is Included (in coded form)	Taxonomy & Total Frequency

2. Once the frequency of a competency was established, it was possible to establish criteria for inclusion of a competency statement in the list of common competencies. Determining the cutoff point in the frequency scale was done by trial and considered judgment. For example, if a RAP taxonomy had twelve occupations and a competency had a frequency of six, then it was included in fifty percent of the occupations. The fifty percent criteria led to a considerable number of competencies being eliminated. The cutoff was therefore lowered to thirty-three percent, i.e. a frequency of four for the example being considered. It was found that some of the compentencies were relevant (common) to occupations in some taxonomy areas, whereas a few were relevant (common) to all taxonomy areas. For a competency to be considered common to all taxonomy areas, it had to be listed in at least twenty-five percent of the occupations listed in either the RAP or MAP area.

3. Once the common competencies were identified, it was decided that the occupations in which each competency was included should also be provided. Because the competency statements are general in nature, it was felt that a proper interpretation of the statement by the user--the teacher, the curriculum designer or even the student --would be facilitated by the simultaneous listing of relevant occupations. Data gathered from industry would always tend to be in the form, "Which competencies are included in a particular occupation?" Those involved in instructional design or instruction in a core curriculum would find the data to be useful in the form, "Which are the occupations in which a particular competency is included?" The following format was developed to present the common competency list to enable the users to have a clear understanding of the common competencies expressed in comparatively general terms, by connecting up with the occupations containing the competency.

Competency	Occupations Containing the Competency	Relevant Taxonomy

The product, i.e. the list of common competency clusters and related occupations for RAP and MAP, can be found in the following pages.

4. A final listing was prepared for use both as a reference and to acquaint the user with the wide range of competencies identified during the course of the study. For both RAP and MAP, each taxonomy is treated individually listing occupations, common competencies and additional competencies identified. This listing can also be found in the pages that follow.

CONCLUSION

One of the important findings relates to competencies found in the affective domain. The resource material used for identification of common competencies contained very few of the affective competencies. There appears to be broad agreement about the need for developing competencies in the affective domain. Therefore, along with the list of common competencies, a separate list of Affective Work Competencies contained in the report, "Necessary Work Values, Habits and Attitudes," has been provided for the guidance of the curriculum designers. This list would be of great value to those involved in designing instructional units aimed at developing the affective competencies.

The common competency listings provided in this chapter could be of use in a variety of ways. In the curriculum design process, including program formulation and detailing and production of instructional material, the list would provide substantial guidance. The individual teachers could use the list for detailing instructional strategies, selection and organization of content and selection of examples. However it is used, the competency listing reflects current Illinois agricultural occupations.

OCCUPATION AND COMPETENCY LISTINGS

The following section contains the listings of occupations and competencies identified by this study. The Rural Agriculture Program and Metropolitan Agriculture Program material is presented separately for the convenience of those working in those areas. The listings contained in this portion are:

OCCUPATIONS
COMMON COMPETENCIES, RELATED OCCUPATIONS AND TAXONOMIES
COMPETENCIES
AFFECTIVE WORK COMPETENCIES
OCCUPATIONS IDENTIFIED BY BOTH RAP AND MAP

The OCCUPATIONS listing presents the occupations chosen for the study with their code numbers. The COMMON COMPETENCIES, RELATED OCCUPATIONS AND TAXONOMIC listings identifies the common competency, the occupations containing that competency and the taxonomy in which the competency was found to be common. Those common competencies marked ALL are those which were found in a quarter of the occupations in several or all taxonomies in the RAP or MAP areas. Finally, the COMPETENCIES listing is a reference listing showing in one place the occupations, common competencies and other competencies identified by taxonomy. The heading, "Additional Competencies Identified," are those competencies which were found, but which did not appear frequently enough in a taxonomy to be considered common.

RURAL AGRICULTURE PROGRAM

OCCUPATIONS

NOTE: Those occupations marked with an asterisk are mid-management level and generally require training and experience beyond high school.

.01 - Agricultural Production

0101	Farmer Cash Grain
0102	Corn Grower
0103	Wheat Grower
0104	Forage Producer
0105	Vegetable Grower
0106	Farm Worker (Vegetable) I & II
0107	Farm Worker (Grain) I & II
0108	Soybean Grower
0109	Tree Fruit Producer
0110	Livestock Producer
0111	Poultry Producer (Broiler Grower)
0112	Farm Worker Broiler (Poultry)
0113	Animal Caretaker (Lab Animal Assistant)
0114	Small Fruit Producer

.02 - Agricultural Supplies and Services

0201	Sales Person (Counter)
*0202	Sales Representative
0203	Warehouse Worker (Ag. Chem)
0204	Veterinary Assistant
*0205	Artificial Breeding Technician
*0206	Irrigation Technician (Sprinkling System)
0207	Sales Person Pets/Pet Supplies
0208	Dog Groomer
0209	Pet Shop Attendant (Worker)
*0210	Scout (Insect Control)
0211	Artificial Inseminator
*0212	Farrier
*0213	Veterinary Technician
*0214	Commission Agent

0.3 - Agricultural Mechanics

0301	Tractor Mechanics Helper
0302	Set Up Mechanic
0303	Assistant Parts Person

0304	Small Engine Mechanic
*0305	Agricultural Equipment Installer
*0306	Farm Equipment Mechanic
*0307	Supervisor, Farm Equipment Maintenance
*0308	Diesel Mechanic
*0309	Electrician

.04 - Agricultural Products

0401	Dairy Sales Route Driver
0402	Dairy Plant Helper
0403	Pasteurizer
0404	Produce Clerk
0405	Cold Storage Locker Worker
0406	De-hairing Machine Tender
0407	Cannery Worker
0408	Cereal Grain Worker
*0409	Meat Cutter (Retail)
0410	Butcher (Slaughtering and Meat Packing)
*0411	Cheese Maker
*0412	Sausage Maker
0413	Flour Miller's Assistant
*0414	Production Coordinator-Cereal Grains

.05 - Ornamental Horticulture

0501	Groundman
0502	Floral Sales Person
0503	Trainee (Aboriculture)
0504	Floral Designer
0505	Greenhouse Foreman
0506	Floral Shop Manager
0507	Greenhouse Worker
0508	Grounds Supervisor
0509	Crew Foreman
0510	Grounds Worker
0511	Landscape Aide
0512	Retail Landscape and Garden Store Sales Person
0513	Nursery Worker
0514	Plant Propagator
0515	Nursery Mechanic
0516	Nursery Sales Person
0517	Golf Couse Maintenance Worker
0518	Maintenance Worker - Park
0519	Golf Course Mechanic
0520	Golf Course Pest Control Specialist

0521	Golf Course Maintenance Foreman
0522	Golf Course Irrigation Specialist

.06 - Renewable Natural Resources

*0601	Park Ranger
0602	Camp Ground Care Taker
0603	Soil Conservation Aide
0604	Fish Hatchery Worker
0605	Conservation Aide
0606	Game Keeper
0607	Park Worker
*0608	Hunting and Fishing Guide
*0609	Soil Conservation Technician
*0610	Fish and Game Warden

.07 - Forestry

0701	Forestry Aide
0702	All Around Logger
0703	Sawmill Worker
0704	Christmas Tree Worker

RURAL AGRICULTURE PROGRAM

COMMON COMPETENCIES, RELATED OCCUPATIONS AND TAXONOMIES

	Competency	Occupations Containing Competency	Relevant Taxonomy
1.	Keeps records	0101, 0102, 0103, 0104 0105, 0109, 0110, 0111, 0112; 0206, 0204, 0209; 0303, 0402, 0403, 0411, 0414; 0504, 0506, 0507, 0508, 0509, 0519, 0521, 0522; 0601, 0603, 0604, 0609, 0610; 0701, 0702.	All (01, 05, 06)
2.	Supervises Workers	0101, 0103, 0104, 0106, 0108, 0109, 0110, 0111, 0112, 0114; 0206; 0307; 0411, 0413; 0505, 0506, 0508, 0509, 0521; 0601, 0605, 0607, 0609, 0610.	All (01, 06)
3.	Follows/Insures Safety Procedures	0110, 0112; 0203, 0208, 0209, 0212, 0213; 0301, 0302, 0304, 0306, 0307; 0402, 0409, 0413, 0414; 0501, 0503, 0507, 0512, 0515; 0601, 0605, 0607, 0608, 0610; 0702, 0703.	All (02, 03, 06, 07)
4.	Operates Equipment	0201, 0202; 0402, 0403, 0405, 0406, 0407, 0408, 0409, 0411, 0412, 0414; 0501, 0506, 0507, 0508, 0511, 0518; 0605; 0701, 0704.	All (04, 05)
5.	Prepares Land	0101, 0102, 0103, 0104, 0105, 0106, 0107, 0108; 0509, 0518.	01
6.	Selects Land	0105, 0109, 0110, 0111, 0112	01
7.	Purchase of Seeds	0101, 0102, 0103, 0104, 0105, 0108.	01
8.	Selection of Seeds	0101, 0102, 0103, 0104, 0105, 0108, 0114.	01

	Competency	Occupations Containing Competency	Relevant Taxonomy
9.	Production Economics, Budgeting, Costing, Finance	0101, 0102, 0103, 0104, 0108, 0109, 0110.	01
10.	Marketing	0101, 0102, 0103, 0104, 0105, 0108, 0109, 0114; 0214; 0704.	01
11.	Detects Signs of Illness	0110, 0111, 0112, 0113.	01
12.	Adminsters Medication	0110, 0111, 0112, 0113; 0213.	01
13.	Identifies/Controls Pests, Weeds, Diseases	0101, 0102, 0103, 0104, 0108, 0109; 0114; 0210; 0501, 0503, 0505, 0507, 0508, 0510, 0513, 0518, 0520; 0704.	01, 05
14.	Determines Rate of Fertilizer Based on Soil Tests	0101, 0102, 0103, 0104, 0105, 0108, 0109; 0507, 0508, 0509, 0510; 0704.	01
15.	Applies Fertilizer	0101, 0102, 0103, 0104, 0105, 0106, 0108, 0109; 0503, 0507, 0508, 0509; 0704.	01
16.	Plants, Cultivates Harvests	0101, 0102, 0103, 0104 0105, 0106, 0107, 0108, 0109, 0114; 0505, 0507, 0509, 0510, 0511, 0512, 0513, 0518; 0704.	01, 05
17.	Plans Harvesting, Storing	0101, 0102, 0103, 0104, 0105, 0108, 0109, 0114.	01
18.	Operates Farm Machinery	0101, 0103, 0104, 0105, 0106, 0107, 0108, 0109, 0110, 0111, 0112; 0306.	01
19.	Maintains and Repairs Farm Machinery	0106, 0107, 0110, 0111 0112; 0203; 0302.	01
20.	Maintains Inventory	0110, 0111, 0113; 0201, 0203, 0207, 0208, 0209; 0303; 0404, 0409; 0512, 0519, 0521.	02

	Competency	Occupations Containing Competency	Relevant Taxonomy
21.	Handles, Restrains Animals	0113; 0204, 0208, 0209, 0212, 0213.	02
22.	Performs Shop Tasks (carpentry, welding, etc.)	0212; 0301, 0302, 0305, 0306, 0308, 0309; 0508, 0509, 0519; 0607.	03
23.	Maintains and Repairs Engine Systems	0212; 0301, 0304, 0305, 0306, 0308, 0309; 0409; 0507, 0508, 0510, 0515, 0519.	03
24.	Identifies Species	0501, 0503, 0504, 0505, 0506, 0508, 0509, 0510, 0512, 0516; 0604, 0605, 0608; 0704.	05, 06
25.	Maintains Lawns, Trees, Shrubs	0503, 0508, 0509, 0510 0511, 0517, 1518; 0602, 0607.	05
26.	Constructs/Maintains Buildings, Landscape Items	0110; 0301, 0306; 0505, 0507, 0508, 0509, 0510, 0511, 0515; 0605.	05
27.	Prepares Schedules, Plans	0504, 0508, 0509, 0514, 0517, 0522.	05
28.	Collects Data	0206; 0603, 0605, 0609, 0610; 0701.	06
29.	Provides Information	0601, 0605, 0609.	06
30.	Performs Public Relations Work	0608, 0609, 0610.	06
31.	Repairs/Maintains Buildings/Equipment	0107, 0110,; 0301, 0305, 0306; 0501, 0503, 0505, 0507, 0510, 0513, 0515, 0519; 0602, 0604, 0607; 0702, 0703.	06, 05
32.	Performs Survey	0306; 0509; 0603, 0605, 0609; 0701.	06

RURAL AGRICULTURE PROGRAM

COMPETENCIES

NOTE: Those occupations marked with an asterisk are mid-level and generally require training and experience beyond high school.

.01 - Agricultural Production

Occupations:

Farmer, Cash Grain
Corn Grower
Wheat Grower
Forage Producer
Vegetable Grower
Farm Worker (Vegetable) I & II
Farm Worker (Grain) I & II
Small Fruit Producer
Soybean Grower
Tree Fruit Producer
Livestock Producer
Poultry Producer (Broiler Grower)
Farm Worker (Poultry
Animal Caretaker (Lab Animal Assistant)

Competencies Common to Taxonomy:

Keeps Records
Supervises Workers
Follows/Insures Safety Procedures
Operates Equipment
Prepares Land

Selects Land
Purchases Seeds
Selects Seeds
Practices Sound Production Economics, Budgeting, Costing, Finance
Marketing

Detects Signs of Illness
Administers Medication
Identifies/Controls Pests, Weeds, Diseases
Determines Rate of Fertilizer Based on Soil Tests
Applies Fertilizer

Plants, Cultivates, Harvests
Plans Harvesting, Storage
Operates Farm Machinery
Maintain and Repair Farm Machinery

Additional Competencies Identified:

Practices Good Human Relation Skills
Selects, Breeds Animals
Raises Livestock
Handles and Cares for Animals
Attaches Tags to Identify Animals

Additional Comptetencies Identified, Cont'd:

Practices Good Feed and Feeding Procedures
Selects Pasture for Grazing
Produces Forage for Animals
Disinfects and Vaccinates Animals
Treats Minor Injuries and Ailments

Arranges for Sale of Animals
Butchers Animals, Cures Meat
Shears Sheep
Handles Products
Schedules/Plans Plantings/Work Schedule/Watering

Understands and Practices Plant Progagation
Irrigates Land
Constructs Buildings
Repairs, Maintains Buildings/ Equipment
Selects, Purchases Poultry Stock

Raises Poultry for Producing Eggs and Meat
Maintains Inventory
Dispenses Medicines/Supplies
Uses/Maintains Laboratory Equipment
Performs Laboratory Tests

.02 - Agricultural Supplies and Services

Occupations:

- Sales Person (Counter)
- *Sales Representative
- Warehouse Worker (Ag. Chem)
- Veterinary Assistant
- *Artificial Breeding Technician
- *Irrigation Technician (Sprinkling System)
- Sales Persons Pets/Pet Supplies
- Dog Groomer
- Pet Shop Attendant (Worker)
- *Scout (Insect Control)
- Artificial Inseminator
- *Farrier
- *Veterinary Technician
- *Commission Agent

Competencies Common to Taxonomy:

- Keeps Records
- Supervises Workers
- Follows/Insures Safety Procedures
- Operates Equipment
- Maintains Inventory

- Handles, Restrains Animals

Additional Competencies Identified:

- Practices Good Human Relation Skills
- Possesses Good Work Habits and Attitudes
- Develops Managerial Abilities
- Possesses Good Oral and Written Skills
- Performs General Office Work

- Prepares Business Forms
- Displays Merchandise
- Sells Merchandise (Merchandising)
- Possesses Packing, Unpacking, Shipping Skills
- Purchases Equipment

- Advises Customer on Pet Care
- Orders Tropical Fish
- Receives and Handles Tropical Fish
- Records Client Information
- Appraises/Selects Livestock

- Arranges for Sale of Animals
- Shows Livestock
- Handles Cattle
- Attaches Tags to Identify Animals
- Cares for and Treats Cattle

- Disinfects and Vaccinates Animals
- Detects Signs of Illness
- Performs Emergency First Aid
- Collects, Packages Semen
- Examines Semen

Additional Competencies Identified, Cont'd:

Packages Semen
Handles Semen
Inseminates Cattle
Handles and Cares for Animals/Bees
Records Information

Grooms Animals
Feeds Animals, Birds, Fish
Maintains Sanitary Conditions
Possesses Knowledge of Veterinary
  Techniques and Practices
Buys and Cares for Medicants

Dispenses Medicines/Supplies
Administers Medication
Identifies Parasites
Administers Anesthetics
Cares for and Uses Facilities and Equipment

Uses Surgical Equipment
Operates X-Ray Machine
Uses, Maintains Laboratory Equipment
Performs Laboratory Tests
Tests for Microorganisms

Prepares Suspect Rabies Tissue Samples
Diagnosis and Corrects Foot and Gait Problems
Forms and Shapes Metal Shoes
Uses Forge
Prepares Feet and Hooves of Animals for Shoeing

Understands Soil Science Relationships
Understands/Applies Pesticides and Pest Control
  Procedures
Prepares and Applies Exterminating Agents
Calibrates Spraying Equipment
Collects Samples for Lab Analysis

Welds
Uses and Maintains Hand and Power Tools
Maintains Equipment
Operates Specialized Farm Equipment
Collects Soil Data

Maintains Pipes, Valves, Pumping Equipment
Operates Pumps, Valves
Regulates Supply of Water
Operates Sprinkling System

.03 - Agricultural Mechanics

Occupations:

Tractor Mechanics' Helper

Set Up Mechanic
Assistant Parts Person
Small Engine Mechanic
*Agricultural Equipment Installer
*Farm Equipment Mechanic
*Supervisor, Farm Equipment Maintenance
*Diesel Mechanic
*Electrician

Competencies Common to Taxonomy:

Keeps Records
Supervise Workers
Follows/Insures Safety Procedures
Operates Equipment
Performs Shop Tasks (carpentry, welding, etc.)
Maintains and Repairs Engine Systems

Additional Competencies Identified:

Possesses Good Work Habits and Attitudes
Trains Workers
Practices Good Management
Possesses Good Oral and Written Communication Skills
Maintains Inventory

Requisitions Parts and Supplies
Performs General Office Work
Adapts Warehousing and Merchandising Systems
Displays Merchandise
Advises Customers

Estimates Cost of Installing/Maintaining Agricultural System (Ag. Equip. Installer, Electrician)
Uncrates Farm Machinery
Assembles and Erects Farm Machinery
Possesses Packing, Unpacking and Shipping Skills
Analyzes and Solves Problems

Maintains and Adjusts Farm Machinery
Diagnosis Malfunctions
Overhauls Machinery and Equipment
Disassembles and Examines Engine
Rebuilds Small Engines

Measures Engine Parts
Installs Equipment
Maintains Equipment

Additional Competencies Identified, cont'd:

Inspects Equipment for Safety
Monitors System's Performance (Test)

Installs and Maintains Irrigation & Drainage Systems
Installs and Maintains Electrical Systems
Designs Wiring/Electrical Layout
Prepares Sketches of System Layout
Reads Blueprints and Drawings

Maintains and Uses Parts Manual
Operates Farm Machinery
Maintains Farm Shop
Uses and Maintains Hand and Power Tools
Repairs, Maintains Buidings/Equipment

Constructs Buildings
Installs Fencing
Assists in Surveying (Land)

.04 - Agricultural Products

Occupations:

Dairy Sales Route Driver
Dairy Plant Helper
Pasteurizer
Produce Clerk
Cold Storage Locker Worker
De-Hairing Machine Tender
Cannery Worker
Cereal Grain Worker
*Meat Cutter (Retail)
Butcher (Slaughtering & Meat Packing)
*Cheese Maker
*Sausage Maker
*Flour Miller's Assistant
*Production Coordinator - Cereal Grains

Competencies Common to Taxonomy:

Keeps Records
Supervises Workers
Follows/Insures Safety Procedures
Operates Equipment

Additional Competencies Identified:

Works Harmoniously with Others
Follows Instructions of Supervisor
Follows/Understands Legal Regulations
Maintains Inventory
Fills Requisition Work Orders

Obtains Orders
Maintains/Orders Supplies
Purchases Meat, Poultry, Supplies
Receives Meat Shipments
Lists and Totals Prices for Produce

Performs General Work
Displays Merchandise (Merchandising)
Sells Merchandise
Delivers Merchandise
Maintains Sanitary Conditions

Keeps Work Area Clean
Choose Ingredients (Cheese Maker, Sausage Maker)
Prepares Ingredients
Loads/Empties Mixture into Container/Machine
Collects Samples for Lab Analysis

Tests Product
Packages Product
Stores Product
Works in Adverse Conditions
Knows Mill Products and Processes (Cereal Grain)

Additional Competencies Identified, Cont'd:

Loads and Unloads Cereal (Grain) from Trucks
Stuns and Slaughters Animal
Prepares Carcass (Split, Trim, Wash)
Prepares Hide (Skin, Trim, Clean)
Prepares Viscera

Prepares Meat Cuts for Market (Butcher)
Cuts Meat (Beef, pork, lamb, veal - Retail)
Uses and Maintains Hand and Power Tools
Performs Shop Tasks (Weld, use Drill Press, etc.)
Installs Equipment

Cleans Equipment
Inspects Equipment for Safety
Maintains Machinery
Reports Need for Repairs
Operates and Services Truck

.05 - Ornamental Horticulture

Occupations:

Groundman
Floral Sales Person
Trainee (Aboriculture)
Floral Designer
Greenhouse Foreman

Floral Shop Manager
Greenhouse Worker
Grounds Supervisor
Crew Foreman
Grounds Worker

Landscape Aide
Retail Landscape & Garden Store Sales Person

Landscape Aide
Retail Landscape & Garden Store Sales Person

Nursery Worker
Plant Propagator
Nursery Mechanic
Nursery Salesperson
Golf Course Maintenance Worker

Maintenance Worker - Park
Golf Course Mechanic
Golf Course Pest Control Specialist
Golf Course Maintenance Foreman
Golf Course Irrigation Specialist

Competencies Common to Taxonomy:

Keeps Records
Supervises Workers
Follows/Insures Safety Procdures
Operates Equipment
Identifies/Controls Pests, Weeds, Diseases

Plants, Cultivates, Harvests
Identifies Plant Species
Maintains Lawns, Trees, Shrubs
Constructs/Maintains Buildings, Landscape Items
Prepares Schedules, Plans

Repairs/Maintains Buildings/Equipment

Additional Competencies Identified:

Maintains Inventory
Hires Workers
Possesses Good Oral and Written Communication Skills
Practices Good Management
Analyzes and Solves Problems

Develops Good Work Habits and Attitudes
Works Harmoniously with Others
Advises Customers
Displays Merchandise
Sells Merchandise (Merchandising)

Additional Competencies Identified, Cont'd:

Obtains Signatures and Orders
Delivers Merchandise
Prepares Advertising Announcements
Performs General Office Work
Estimates Cost of Floral Arrangements/Plants/Supplies

Creates Basic Floral Designs
Performs Emergency First Aid
Tests Soil (Takes Soil Sample)
Prepares Land (Seedbed Preparation)
Applies Fertilizers

Prepares Soil/Compost (Greenhouse/Mushroom)
Sterilizes Soil
Performs Survey and Layout Work
Understands and Maintains Plant Environment
Understands/Practices Plant Propagation

Cultures Plants in Greenhouse/Nursery
Handles and Stores Flowers, Plants
Processes and Ships Nursery Stock
Irrigates Land
Protects Trees/Shrubs

Transplants Trees and Shrubs
Fells Unwanted Trees
Handles Rope
Installs Equipment
Understands Greenhouse Machinery

Uses and Maintains Hand and Power Tools
Maintains and Repairs Engine Systems
Keeps Work Area Clean
Installs Drainage/Irrigation System
Maintains Pipes, Valves, Pumping Equipment

Operates Pumps, Valves
Maintains and Uses Parts Manual
Reads Blueprints and Drawings
Welds
Installs and Maintains Irrigation and Drainage Systems

.06 - Renewable Natural Resoures

Occupations:

- *Park Ranger
- Camp Ground Caretaker
- Soil Conservation Aide
- Fish Hatchery Worker
- Conservation Aide
- Game Keeper
- Park Worker
- *Hunting & Fishing Guide
- *Soil Conservation Technician
- *Fish & Game Warden

Competencies Common to Taxonomy:

- Keeps Records
- Supervises Workers
- Follows/Insures Safety Procedures
- Operates Equipment
- Identifies Species

- Collects Field Data
- Provides Information to Public
- Performs Public Relations Work
- Repairs/Maintains Buildings and Equipment
- Performs Survey (Land)

Additional Competencies Identified:

- Hires Workers
- Practices Good Management
- Possesses Good Oral and Written Communication Skills
- Enforces Rules and Regulations
- Performs Emergency First Aid

- Feed Animals, Birds, Fishes and Understands Nutritional Needs
- Assists in Survey (Land)
- Prepares and Interprets Maps
- Makes Cross-Sections and Profiles
- Gathers Field Data

- Measures Stream Flow
- Uses Fire Fighting Techniques
- Maintains Lawns, Trees, Shrubs, etc.
- Maintains Sanitation
- Maintains and Repair Water Supply

- Maintains Quality of Water
- Installs Fencing
- Operates Truck
- Operates Boat
- Conducts Wildlife Control Program

Additional Competencies Identified, Cont'd:

Supervises Wildlife Permit System
Maintains Wildlife Population
Prepares Cases for Prosecution
Patrols Area
Uses Firearms, Gear, Tackle

Field Dresses and Preserves Game
Selects Campsite
Handles Fish
Practices Sound Production Economics, Budgeting, Costing

.07 - Forestry

Occupations:		
	Forestry Aide	Sawmill Worker
	All Around Logger	Christmas Tree Worker

Competencies Common to Taxonomy:

Keeps Records
Supervises Workers
Follows/Insures Safety Procedures
Operates Equipment

Additional Competencies Identified:

Selects Site for Planting
Determines Soil Suitability for Planting
Identifies Species
Determine Rate of Fertilizer Based on Soil Tests
Applies Fertilizers

Plants, Cultivates and Harvests
Identifies and Controls Pests, Weeds, and Disease
Markets Crop
Performs Emergency First Aid
Develops Good Work Habits and Attitudes

Repairs, Maintains Buildings and Equipment
Follows Safety Precautions
Operates Heavy Machinery
Delivers Logs to Sawmill
Plans and Organizes Logging

Uses Fire Fighting Techniques
Prevents and Control Forest Fires
Enforces Rules and Regulations
Assists in Survey (Land)
Gathers Field Data

METROPOLITAN AGRICULTURE PROGRAM

OCCUPATIONS

.01 - Agricultural Production

0130	Catfish Producer
0131	Horse Production Employee
0132	Broiler Grower
0133	Poultry-egg Producer
0134	Small Animal Supplier
0135	Apiculturist
0136	Mushroom Grower
0137	Small Fruit Producer (Blueberry, Grape, Raspberry, Strawberry)
0138	Small Grain Producers
0139	Crop Producers - General
0141	Tree Fruit Producer
0142	Vegetable Grower

.02 - Agricultural Supplies and Services

0230	Chemical Applicator
0231	Agri-Chemical Manager
0232	Warehouse Man
0233	Sales Clerk
0234	Animal (Vet) Technician
0235	Manager (Grain, Fertilizer, Feed, Seed)
0236	Counterman (Grain, Fertilizer, Feed, Seed)
0237	Helper (Grain Fertilizer, Feed, Seed)
0238	Sales & Service Representative
0239	Dairy Inspector
0240	Egg Inspector
0241	Fruit and Vegetable Inspector
0242	Poultry Inspector
0243	Milk Tester
0244	Animal Health Assistant
0245	Laboratory Animal Assistant
0246	Pet Shop Worker
0247	Dog Groomer

.03 - Agricultural Mechanics

0330	Set-Up Mechanic
0331	Small Engine Mechanic

.04 - Agricultural Products

0430	Laborer - Cereal Grains
0431	Mill Maintenance Man - Cereal Grains
0432	Milk Processor
0433	Dairy Plant Helper
0434	Salesroom Sales Person (Dairy)
0435	Dairy Products Salesman & Milk Truck Driver
0436	Cheese Maker
0437	Laboratory Technician (Dairy)
0438	Slaugther House Worker
0439	Processed Meats Worker
0440	Retail Meat Cutter
0441	Fish Cannery Worker
0442	Poultry Processing Workers
0443	Egg Processing Workers

.05 - Ornamental Horticulture

0530	Groundsman - Arboriculture
0531	Trainee - Arboriculture
0532	Climber - Aroboriculture
0533	Floral Delivery Person
0534	Floral Sales Person
0535	Floral Designer
0536	Greenhouse Foreman
0537	Floral Shop Manager
0538	Greenhouse Worker
0539	Grounds Supervisor
0540	Crew Foreman - Landscape Planter
0541	Grounds Worker
0542	Landscape Aide
0543	Retail Landscape & Garden Store Sales Person
0544	Nursery Worker
0545	Plant Propagator
0546	Nursery Mechanic
0547	Nursery Sales Person
0548	Golf Course Maintenance Worker
0549	Maintenance Worker - Parks
0550	Golf Course Mechanic
0551	Golf Course Pest Control Specialist
0552	Golf Course Maintenance Foreman
0553	Golf Course Irrigation Specialist

.06 - Renewable Natural Resources

0630	Fish Hatchery Worker
0631	Forestry Technician
0632	Campground Maintenance Person
0633	Park Aide
0634	Park Maintenance Person
0635	Soil Conservation Aide
0636	Soil Conservation Technician
0637	Conservation Aide
0638	Game Farmer

.07 - Forestry

0730	Forestry Aide
0731	Sawmill Worker
0732	Christmas Tree Grower

METROPOLITAN AGRICULTURE PROGRAM

COMMON COMPETENCIES, RELATED OCCUPATIONS AND TAXONOMIES

Competency	Occupations Containing Competency	Relevant Taxonomy
1. Keeps Records	0131, 0132, 0133, 0134, 0138 0139, 0140, 0141; 0230, 0239, 0246; 0433, 0436, 0437; 0535 0536, 0537, 0538, 0539, 0540, 0550, 0552, 0553; 0630, 0635, 0636; 0730	All (01, 05, 06)
2. Operates Equipment	0131, 0133, 0135; 0230, 0233, 0237, 0238, 0240, 2041; 0430 0432, 0433, 0436, 0441, 0442, 0443; 0530, 0532, 0537, 0538, 0539, 0542, 0549; 0730, 0732	All (02, 04, 05, 07)
3. Follows/Insures Safety Procedures	0131, 0136; 0230, 0232, 0234, 0330; 0331; 0431, 0433, 0440, 0441; 0530, 0531, 0532, 0538, 0543, 0546; 0631, 0633, 0637; 0731	All (03, 04, 06)
4. Identifies and Controls Insects, Pests, Weeds, Disease	0133, 0135, 0136, 0138, 0139, 0140; 0230, 0239, 0242; 0530, 0531, 0536, 0538, 0539, 0541, 0542, 0544, 0549, 0551; 0631; 0732	All (01, 05)
5. Prepares Land	0138, 0139, 0141	01
6. Purchases Seeds	0138, 1039, 0141	01
7. Selection of Seeds	0138, 0139, 0141	01
8. Production Economics, Budgeting, Costing, Finance	0130, 0133, 0135, 0138, 0139, 0140	01
9. Supervises Workers	0132, 0136, 0138, 0139, 0140; 0631, 0633, 0636, 0637, 0638	01, 06
10. Marketing	0130, 0131, 0135, 0136, 1038, 0139, 0140, 0141	01
11. Detects Signs of Illness	0130, 0131, 0132, 0134	01

Competency	Containing Competency	Taxonomy
12. Determines Rate of Fertilizer Based on Soil Tests	0138, 0139, 1040, 1041	01
13. Applies Fertilizer	0138, 0139, 0140, 0141	01
14. Plans Harvesting and Storing	0130, 0135, 0136, 0138, 0139, 0140, 0141	01
15. Operates Farm Machinery	0132, 0138, 0139, 0140, 0141	01
16. Maintains Sanitary Conditions Cleanliness	0430, 0434, 0436, 0439, 0440, 0441, 0442, 0443	04
17. Identifies Species	0530, 0531, 0532, 0535, 0536, 0537, 0539, 0540, 0541, 0543, 0547; 0630, 0637, 0638	05, 06
18. Plants, Cultivates, Harvests	0536, 0538, 0540, 0541, 0542, 0543, 0544, 0549; 0136, 0137, 0138, 0139, 0140, 0141	05, 01
19. Maintains Lawns, Trees, Shrubs, etc.	0531, 0532, 0539, 0540, 0541, 0542, 0548, 0549	05
20. Repairs/Maintains Buildings/ Equipment	0530, 0531, 0532, 0536, 0538, 0541, 0544, 0546, 0550; 0632, 0633, 0638	05, 06
21. Constructs/Maintains Buildings/ Landscape Items	0536, 0538, 0539, 0540, 0541, 0542, 0546	05
22. Prepares Schedules, Plans	0533, 0535, 0540, 0545, 0548, 0553	05
23. Performs Survey	0631, 0636, 0637	06

METROPOLITAN AGRICULTURE PROGRAM

COMPETENCIES

.01 - Agricultural Production

Occupations:

- Catfish Producer
- Horse Production Employee
- Broiler Grower
- Poultry-Egg Producer
- Small Animal Supplier
- Apiculturist
- Mushroom Grower
- Small Fruit Producer
- Small Grain Producers
- Crop Producers - General
- Tree Fruit Producer
- Vegetable Grower

Competencies Common to Taxonomy:

- Keeps Records
- Operates Equipment
- Follows/Insures Safety Procedures
- Identifies and Controls Insects, Pests, Weeds and Disease
- Plants, Cultivates, Harvests

- Prepares Land
- Purchases Seeds
- Selects Seeds
- Practices Sound Production Economics, Budgeting, Costing, Finance
- Supervises and Hires Workers

- Marketing
- Detects Signs of Illness
- Determines Rate of Fertilizer Based on Soil Tests
- Applies Fertilizer
- Plans Harvesting and Storing

- Operates Farm Machinery

Additional Competencies Identified:

- Selects Land
- Schedules and Plans Work, Plantings, etc.
- Irrigates Land
- Prepares Soil/Compost (Greenhouse)
- Understands/Practices Plant Propagation

- Identifies Species
- Handles and Cares for Animals/Bees
- Feeds Animals/Birds/Fish Properly
- Disinfects and Vaccinates Animals
- Selects/Breeds Animals/Poultry/Bees

Additional Competencies Identified, Cont'd:

Grooms Animals
Maintains Sanitary Conditions
Shows Livestock/Horses
Appraises Livestock/Horses
Trains and Handles Horses

Arranges for Sale of Animals
Understands Role/Use of Laboratory Animals
Processes Fish/Honey
Raises Poultry for Eggs and Meat
Gathers/Handles Eggs

Maintains and Repairs Farm Machinery
Repairs/Maintains Building and Equipment
Installs/Maintains/Repairs Water Supply

.02 - Agricultural Supplies and Services

Occupations:

Chemical Applicator
Agri-Chemical Manager
Warehouse Man
Sales Clerk
Animal (Vet) Technician

Manager (Grain, Fertilizer, Feed, Seed)
Counterman (Grain, Fertilizer, Feed, Seed)
Helper (Grain, Fertilizer, Feed, Seed)
Sales & Service Representative
Dairy Inspector

Egg Inspector
Fruit & Vegetable Inpector
Poultry Inspector
Milk Tester
Animal Health Assistant

Laboratory Animal Assistant
Pet Shop Worker
Dog Groomer

Competencies Common to Taxonomy:

Keeps Records
Operates Equipment
Follows/Insures Safety Procedures
Identifies and Controls Insects, Pests, Weeds, Diseases

Additional Competencies Identified:

Practices Good Human Relations
Possesses Good Work Habits and Attitudes
Practices Good Management
Possesses Good Oral and Written Communication Skills
Sells Merchandise (Merchandising)

Displays Merchandise
Records Information
Maintains Inventory
Prepares Business Forms
Performs Public Relations Work

Possesses Packing, Unpacking and Shipping Skills
Purchases Equipment
Advises Customers on Pet Care
Orders Tropical Fish
Receives and Handles Tropical Fish

Records Client Information
Possesses Knowledge of Veterinary Techniques and Practices
Handles and Cares for Animals
Feeds Animals
Understands How to Restrain Domestic Animals

Additional Competencies Identified, Cont'd:

Cares for and Treats Cattle
Grooms Animals
Attaches Tags to Identify Animals
Buys and Cares for Medicants
Dispenses Medicines/Supplies

Administers Medication
Administers Anesthetics
Disinfects and Vaccinates
Maintains Sanitary Conditions
Cares for and Uses Facilities & Equipment for
  Animal Care

Uses and Maintains Laboratory Equipment
Operates X-Ray Machine
Uses Surgical Equipment
Performs Laboratory Tests
Identifies Parasites

Tests for Microorganisms
Prepares Suspect Rabies Tissue Samples
Understands Soil Science Relationships
Prepares and Applies Exterminating Agents
Calibrates Spraying Equipment

Loads and Unloads Cereal (Grain) from Trucks
Weighs Grain/Handles, Blends Grain
Identifies Hazards/Damage to Grain
Understands and Follows Legal Regulations
Understands all Processing/Shipping Stages
  of Food Product (Inspectors)

Knows/Judges Food Product (Inspectors)
Inspects/Candles Eggs
Operates Specialized Equipment
Maintains Equipment
Repairs/Maintains Buildings/Equipment
Repairs/Maintains Farm Machinery

.03 - Agricultural Mechanics

Occupations: Set-Up Mechanic
Small Engine Mechanic

Competencies Common To Taxonomy:

Keeps Records
Operates Equipment
Follows/Insures Safety Procedures

Additional Competencies Identified:

Possesses Good Oral and Written Communication Skills
Performs General Office Work
Performs Shop Tasks
Uses and Maintains Hand and Power Tools
Diagnoses Mechanical Malfunctions

Maintains and Repairs Engine Systems
Rebuilds Small Engines
Maintains and Uses Parts Manual
Uncrates Farm Machinery
Assembles and Erects Farm Machinery
Maintains and Adjusts Farm Machinery

.04 - Agricultural Products

Occupations:

- Laborer - Cereal Grains
- Mill Maintenance Man - Cereal Grains
- Milk Processor
- Dairy Plant Helper
- Salesroom Sales Person (Dairy)
- Dairy Products Salesman & Milk Truck Driver
- Cheese Maker
- Laboratory Technician (Dairy)
- Slaughter House Worker
- Processed Meats Worker
- Retail Meat Cutter
- Fish Cannery Worker
- Poultry Processing Workers
- Egg Processing Workers

Comptencies Common to Taxonomy:

- Keeps Records
- Operates Equipment
- Follows/Insures Safety Procedures
- Identifies and Controls Insects, Pests, Weeds, Disease
- Maintains Sanitary Conditions/Cleanliness

Additional Competencies Identified:

- Supervises/Hires Workers
- Follows Instructions of Supervisors
- Maintains/Orders Supplies
- Performs General Office Work
- Displays Merchandise

- Sells Merchandise (Merchandising)
- Practices Good Human Relations
- Possesses Good Oral and Written Communication Skills
- Records Information
- Maintains Inventory

- Understands/Follows Legal Regulations
- Schedules Work
- Purchases Meat/Poultry
- Possesses Packing/Unpacking/Shipping Skills
- Chooses Ingredients for Making Food Product

- Prepares Cheeses
- Collects Samples for Lab Analysis
- Tests Product
- Performs Laboratory Tests
- Stores Cheese
- Stuns/Slaughters Animal

Additional Competencies Identified, Cont'd:

Prepares Carcass (Split, Trim, Wash)
Prepares Viscera
Prepares Hide (Skin, Trim, Clean)
Cuts Meat (Beef, Pork, Lamb, Veal)
Prepares Meat Cuts for Market

Loads/Empties Meat Mixture into Container/Machine
Processes Fish
Gathers/Handles Eggs
Inspects/Candles Eggs
Receives Meat Shipments

Understands Mill Products and Processes
Loads and Unloads Cereal (Grain) from Trucks
Possesses Stamina to Work in Adverse Conditions
Possesses Good Physical Condition
Installs Equipment

Assists in Operating/Cleaning Equipment
Records Time, Temperature, Volume Readings
  on Food Processing Machines
Inspects Equipment for Safety
Maintains Machinery
Reports Need for Repairs

Uses and Maintains Hand and Power Tools
Performs Shop Tasks
Operates Truck
Services Truck

.05 - Ornamental Horticulture

Occupations:

Groundsman - Arboriculture
Trainee - Arboriculture
Climber - Arboriculture
Floral Delivery Person
Floral Sales Person

Floral Designer
Greenhouse Foreman
Floral Shop Manager
Greenhouse Worker
Grounds Supervisor

Crew Foreman - Landscape Planter
Grounds Worker
Landscape Aide
Retail Landscape and Garden Store Sales Peson
Nursery Worker

Plant Propagator
Nursery Grower
Nursery Grower Assistant
Nursery Mechanic
Nursery Sales Person

Golf Course Maintenance Worker
Maintenance Worker - Parks
Golf Course Mechanic
Golf Course Pest Control Specialist
Golf Course Maintenance Foreman

Golf Course Irrigation Specialist

Competencies Common to Taxonomy

Keeps Records
Operates Equipment
Follows/Insures Safety Procedures
Identifies and Controls Insects, Pests, Weeds, Disease
Identifies Species

Plants, Cultivates, Harvests
Maintains Lawns, Trees, Shrubs, etc.
Repairs/Maintains Buildings and Equipment
Constructs/Maintains Buildings & Landscape Items
Prepares Schedules and Plans

Additional Competencies Identified:

Supervises and Hires Workers
Works Harmoniously with Others
Possesses Good Work Habits and Attitudes
Practices Good Management
Possesses Good Oral and Written Communication Skills

Performs General Office Work
Analyzes and Solves Problems
Sells Merchandise (Merchandising)
Advises Customers
Displays Merchandise

Prepares Advertising Announcements
Delivers Merchandise
Maintains Inventory
Obtains Signatures and Orders
Estimates Cost of Floral Arrangements, Plants and Supplies

Creates Basic Floral Designs
Performs Emergency First Aid
Understands and Maintains Plant Environment
Understands Greenhouse Machinery
Prepares Soil and Compost (Greenhouse)

Understands and Practices Plant Propagation
Cares for and Maintains Plants in Greenhouse/Nursery
Applies Fertilizer
Handles and Stores Flowers and Plants
Processes and Ships Nursery Stock

Performs Survey and Layout Work
Prepares Land (Seedbed)
Tests Soil (Takes Soil Sample)
Sterilizes Soil
Transplants Trees and Shrubs

Cares for and Maintains Turf/Shrubs
Protects Trees/Shrubs
Fells Unwanted Trees
Handles Rope
Constructs Buildings

Reads Blueprints and Drawings
Maintains and Repairs Engine Systems
Uses and Maintains Hand and Power Tools
Welds
Installs and Maintains Irrigation and Drainage Systems

Additional Competencies Identified, Cont'd:

- Installs Equipment
- Operates Pumps, Valves
- Maintains Pipes, Valves, Pumping Equipment
- Maintains and Uses Parts Manual
- Irrigates Land

.06 - Renewable Natural Resources

Occupations:

Fish Hatchery Worker
Forestry Technician
Campground Maintenance Person
Park Aide
Park Maintenance Person
Soil Conservation Aide
Soil Conservation Technician
Conservation Aide
Game Farmer

Competencies Common to Taxonomy:

Keeps Records
Operates Equipment
Follows/Insures Safety Procedures
Identifies and Controls Insects, Pests, Weeds, Disease
Identifies Species

Repairs/Maintains Buildings/Equipment
Supervises Workers
Performs Survey (Land)

Additional Competencies Identified:

Practices Good Production Economics, Budgeting, Costing
Possesses Good Oral and Written Communication Skills
Trains Workers
Analyzes and Solves Problems
Practices Good Management
Purchases Equipment

Performs Public Relations Work
Maintains Wildlife Exhibit
Demonstrates Good Conservation Practices
Works with Landowners to Maintain Established Soil Conservation Practices
Administers Outdoor Recreation

Enforces Game Laws
Maintains Sanitation
Maintains Lawns, Trees, etc.
Selects/Purchases Poultry Stock (Game Farmer)
Breeds Game Animals and Birds

Administers Medication
Handles Fish
Feeds Animals/Birds/Fish
Uses Fire Fighting Techniques
Prevents and Controls Forest Fires

Additional Competencies Identified, Cont'd:

Prepares and Interprets Maps
Measures Stream Flow
Makes Cross-Sections and Profiles
Gathers Field Data
Collects Samples for Lab Analysis

Computes Quanities
Cruises Timber
Reforests
Maintains Watershed
Maintains Forest

Utilizes Appropriate Engineering Practices
Installs/Maintains/Repairs Water Supply System
Maintains Quality of Water
Installs Fencing

.07 - Forestry

Occupations:

- Forestry Aide
- Sawmill Worker
- Christmas Tree Grower

Competencies Common to Taxonomy:

- Keeps Records
- Operates Equipment
- Follows/Insures Safety Procedures
- Identifies and Control Insects, Pests, Weeds, Diseases

Additional Competencies Identified:

- Develops Good Work Habits and Attitudes
- Markets Product
- Performs Emergency First Aid
- Determines Suitability of Soil for Crop
- Selects Site for Planting

- Identifies Species
- Determines Rate of Fertilizer Based on Soil Tests
- Applies Fertilizer
- Plants, Cultivates, Harvests
- Prevents and Controls Forest Fires

- Uses Fire Fighting Techniques
- Gathers Field Data
- Assists in Survey (Land)
- Operates Heavy Machinery
- Repairs/Maintains Buildings/Equipment

SUGGESTED AFFECTIVE WORK COMPETENCY CLUSTERS

1. Ambitious
2. Cooperative/Helpful
3. Adaptable/Resourceful
4. Considerate/Courteous
5. Independent/Initiating
6. Accurate/Quality of Work
7. Careful/Alert/Perceptive
8. Pleasant/Friendly/Cheerful
9. Responsive/Follow Directions
10. Emotionally Stable/Judgemental/Poised
11. Persevering/Patient/Enduring/Tolerant
12. Neat/Orderly/Personal Appearance/Manner
13. Dependable/Punctual/Reliable/Responsible
14. Efficient/Quantity of Work/Achieving/Speedy
15. Dedicated/Devoted/Honest/Loyal/Conscientious

Source: "Necessary Work Values, Habits, and Attitudes." H. C. Kazanas, D. P. Beach, J. Sapko, Jr., K. A. Sisson, University of Missouri-Columbia, 1978.

OCCUPATIONS IDENTIFIED BY BOTH RAP AND MAP

Broiler Grower
Small Grain Producers
Crop Producers - General
Tree Fruit Producer
Vegetable Grower

Warehouse Man - Agri Chemicals
Sales Clerk
Animal (Vet) Technician
Sales and Service Representative
Pet Shop Worker

Dog Groomer
Set-Up Mechanic
Small Engine Mechanic
Laborer - Cereal Grains
Milk Processor (Pasteurizer)

Dairy Plant Helper
Dairy Poducts Salesman &
  Milk Truck Driver
Cheese Maker
Slaughter House Worker
Retail Meat Cutter

Fish Cannery Worker
Groundman - Arboriculture
Trainee
Floral Sales Person
Floral Designer

Greenhouse Foreman
Floral Shop Manager
Greenhouse Worker
Grounds Supervisor
Crew Foreman - Landscape Planter

Grounds Worker
Landscape Aide
Retail Landscape & Garden
  Store Sales Person
Nursery Worker
Plant Propagator

Nursery Mechanic
Nursery Sales Person
Golf Course Maintenance Worker
Maintenance Worker - Parks
Golf Course Mechanic

Golf Course Pest Control Specialist
Golf Course Maintenance Foreman
Golf Course Irrigation Specialist
Fish Hatchery Worker
Campground Maintenance Person

Park Aide
Soil Conservation Aide
Soil Conservation Technician
Conservation Aide
Forestry Aide

Sawmill Worker
Christmas Tree Grower

SOURCES CONSULTED

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Kazanas, H. C., D. P. Beach, J. Sapko Jr., K. A. Sisson and R. List. Necessary Work Values, Habits and Attitudes. Final Report. Columbia: College of Education, University of Missouri-Columbia, 1978.

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U.S. Department of Labor, Employment and Training Administration. *Dictionary of Occupational Titles*, 4th Edition. Washington, D.C.: Employment and Training Administration, 1977.

Utah State University. Job Analysis and Instructional Behavioral Objectives for Natural Resource Occupations. Results of a workshop held by Utah Vocational Agricultural Teachers. Logan: Utah State University, 1974.

MINUTES OF RURAL AGRICULTURE PROGRAM ADVISORY COMMITTEE

MEETING OF APRIL 11, 1980

1. Attendance: The following persons attended the first meeting of the R.A.P. Advisory Committee at 426 Mumford Hall, on the University of Illinois campus at Urbana, from 9:30 a.m. to 3:30 p.m. on April 11, 1980.

2. Committee members present:

Russ Leman, Roanoke-Benson High School
Richard Dunn, Seneca High School
Charles Ferguson, Pittsfield High School
Larry Keyser, Clay City High School
Don Kaufmann, Grundy County A.V.C.
William Martinie, Illinois Central College
Louis Wagner, Sommer Brothers Seed Co., Pekin, IL
Roger Neitfeld, Pfister Implement Co., Bloomington, IL
Frank Louis Selmi, Selmi Greenhouse/Vegetable Farm, Rock Fall, IL
Ray Lett, Illinois Department of Agriculture

b. Project staff present:

Dr. Paul Hemp, Project Co-director
Dr. Roger Courson, Project Co-director
Dr. Leon Mayer, Rural Agriculture Program Leader
Dr. Burton Swanson, Principal Investigator
Carolyn Sands, Research Associate
Jerry Pepple, Project Assistant

c. Committee members absent:

Allen Hornbrook, Paris High School

Robin Shirley, Tri-Valley High School-Ellsworth

2. Paul Hemp, Project Co-director, presented an overview of the project plan for this year.

3. Paul Hemp, Roger Courson, Leon Mayer, and Jerry Pepple presented progress reports on project activities to date as follows:
   a. Visits by project staff and others to observe core curriculum programs in Indiana, in Oklahoma, and in the metropolitan areas of Cleveland, Philadelphia, and New York City.
   b. Samples of course outlines collected from Illinois teachers.
   c. A survey of Illinois teachers to ascertain their perceptions regarding the relative importance of selected areas of course content for high school agricultural occupations programs.
   d. The search for curriculum materials being conducted by the Vocational Agriculture Service.

3. Carolyn Sands, Project Research Associate, reported on a study she has completed on manpower needs for agricultural occupations in Illinois. Upon analysis of the report (detailed copy to be made available), the R.A.P. Advisory Committee made the following observations:
   a. The large scope and variety of agriculture in Illinois gives rise to many opportunities for entry-level employment in the agricultural occupations in Illinois. Prospects for employment in agricultural supply and service and in agricultural mechanics seem to be especially promising implying the need for high schools to conduct occupational education programs in these areas; however, it was noted that some of the non-farm

agricultural occupations jobs require specialized education at the post-high school level.

b. The success of community college agriculture programs depends in large part upon the development and maintenance of strong programs of agricultural occupations in their feeder high schools.

c. There will be continuing strong need for effective leadership in agriculture, which implies the need for leadership education to be included in agricultural occupations programs.

4. The R.A.P. Advisory Committee was asked to react to a list of job titles for the agricultural occupations, derived from the U.S. Labor Department, Dictionary of Occupational Titles, to identify typical job titles for Illinois agricultural occupations, which might be used as a basis for a proposed competency study to be used as a partial basis for curriculum content for the core curriculum project. Typical job titles for the seven agricultural occupations areas were tentatively identified and clustered into broad occupational areas. This list of job titles is to be further refined by the project research associate, and validated through consultation, via telephone, with individual R.A.P. advisory committee members; and the final list of job titles is to be reported at the next meeting of the R.A.P. Advisory Committee, along with a progress report on the competency study, based upon these job titles.

5. A consensus was reached regarding the purposes to be served by high school agricultural occupations programs in Illinois. It was agreed that high school program of agricultural occupations in Illinois should be multipurpose programs, which would include the following purposes:

a. To provide career awareness and career orientation to all who are interested.

b. To provide a broad background of education in agricultural knowledges and skills to prepare all students enrolled in the program to engage in job training for a specific job or further education in the agricultural occupations.

c. To deliberately and systematically provide leadership and citizenship education for all students enrolled in high school agricultural occupations programs.

d. To provide occupational education to prepare students, who have been able to make a career choice, with entry-level qualifications for the specific agricultural occupations or jobs.

6. It was agreed that the core curriculum program for Illinois should be structured into four year-long basic core courses as follows:

   a. Basic core I and II would be a program core, consisting of common learnings for all students.

   b. Basic core III and IV would be a general core, with heavy emphasis on agricultural production.

   c. Specialized program core courses (for multiple-teacher departments) would be prepared in later phases of the project, for specialized agricultural occupations areas.

   d. Curriculum materials would be prepared for individualized job-instruction for specific job titles, in later phases of the project, to be used in cooperative education programs for the agricultural occupations.

7. The next meeting was scheduled for May 16, 1980 at Urbana.

Leon A. Mayer
Rural Agriculture Program Leader

MINUTES OF THE RURAL AGRICULTURE PROGRAM ADVISORY COMMITTEE MEETING OF MAY 16, 1980

1. Attendance: The following persons attended the second meeting of the R.A.P. Advisory Committee, at 426 Mumford Hall, on the University of Illinois campus at Urbana, from 9:30 A.M. to 3:30 P.M. on May 16, 1980.

   (a) Committee members present:

      1. Richard Dunn, Seneca High School
      2. Russ Leman, Roanoke-Benson High School
      3. Charles Ferguson, Pittsfield High School
      4. Allen Hornbrook, Paris High School
      5. William Martinie, Illinois Central College
      6. Louis Wagner, Somer Bros. Seed Co., Pekin, IL
      7. Ray Lett, Illinois Department of Agriculture

   (b) Project staff present:

      1. Dr. Paul Hemp, Project Co-director
      2. Dr. Roger Courson, Project Co-director
      3. Dr. Leon Mayer, Rural Agriculture Program Leader
      4. Carolyn Sands, Research Associate
      5. Jerry Pepple, Project Assistant

   (c) Committee members absent:

      1. Larry Keyser, Clay City High School
      2. Don Kaufmann, Grundy County A.V.C.
      3. Roger Neitfeld, Pfister Implement Co., Bloomington, IL
      4. Frank Selmi, Selmi Greenhouse/Vegetable Farm, Rock Falls IL

2. Minutes of the first meeting of April 11, 1980 were approved as written.

3. Jerry Pepple presented a summary report of the survey of Illinois agricultural occupations teachers regarding course content for Core I and Core II courses in agriculture. Based upon a rating scale of 1 to 5, with 1 most important, and 5 least important, the agriculture teachers surveyed rated the importance, for the Core I and Core II curriculum, of various areas of content. The results of this survey are included in another section of this report.

4. Carolyn Sands presented a summary report of a competency study, based upon required competencies specified by the Dictionary of Occupational Titles, and the National Agricultural Competency Study for selected job titles identified by the R.A.P. Advisory Committee in the Agricultural Occupations taxonomy areas of agricultural producation (.01), agricultural supplies and service (.02), agricultural mechanics (.03), agricultural products (.04), ornamental horticulture (.05), agricultural resources (.06), and forestry (.07). In this competency study, a competency was considered to be a common competency for purposes of inclusion in the core curriculum, if this competency was required by one-third of the job titles studied with each of the seven agricultural occupations taxonomy areas. Common competencies were also noted for the seven taxonomy areas. A summary of the common competencies identified, and a list of suggested affective work competency clusters are included in another section of this report.

5. Leon Mayer presented a list of sources to be used in determining curriculum content for the core curriculum program as follows:

(a) Sample copies of course outlines now in use by Illinois agricultural occupations teachers.

(b) The survey of opinions of Illinois agricultural occupations teachers regarding the relative importance of selected areas of core curriculum content.

(c) The curriculum content of core curriculum programs in other states visited and studied.

(d) The competency study completed as a part of Illinois Core Curriculum Project.

(e) The National Agricultural Competency Study.

(f) The best judgement of the Core Curriculum Project Staff.

(g) The recommendations of the Core Curriculum Project Rural Agriculture Program Advisory Committee.

6. Based upon these seven sources listed above, the following components of course content, expressed as units and problem areas, were identified by the R.A.P. Advisory Committee for the Basic Core I Course for the Core Curriculum Program.

Unit A: Orientation and Guidance

Problem Areas

1. Getting acquainted with and succeeding in high school.
2. Getting acquainted with the local school vocational agriculture program.
3. Understanding the nature, scope, and importance of agriculture.
4. Discovering career opportunities in agricultural occupations.

Unit B: Leadership and Citizenship

Problem Areas

1. Understanding and participating in F.F.A.
2. Duties and responsibilities of F.F.A. members.
3. Developing basic parliamentary procedure skills.
4. Developing basic public speaking skills.

Unit C: Supervised Occupational Experience

Problem Areas

1. Understanding supervised occupational experience as an integral part of voational agriculture.
2. Planning a supervised occupational experience program.
3. Keeping records on a supervised occupational experience program.

Unit D: Livestock

Problem Areas

1. The livestock industry.
2. Identifying breeds of livestock and poultry.
3. Selecting livestock.
4. Feeding livestock.

Unit E: Crop Production

Problem Areas

1. Identifying crop and weed seeds.
2. Judging quality of grain for seed and for market.
3. Growing corn.
4. Growing soybeans.

Unit F: Soils and Conservation of Soil, Water and other Natural Resources

Problem Areas

1. Collecting soil samples.
2. Understanding soil test.
3. Basic fertility requirements.

Unit G: Horticulture

Problem Areas

1. Growing vegetables.
2. Beautifying the homestead.

Unit H: Agricultural Mechanics

Problem Areas

1. Identifying, fitting and using hand tools and horticultural tools.
2. Using selected power tools.
3. Understanding and practicing safety in agricultural mechanics.
4. Developing basic carpentry skills.
5. Developing and improving the home shop.

7. The RAP Advisory Committee made the following additional recommendations regarding the preparation of core curriculum instructional materials:

   (a) Core curriculum materials for each year should include an index and each instructional packet within the core curriculum materials for each year should also be indexed.

   (b) All references for student materials required to carry out the core curriculum program for the whole school year, should be listed in order blank form, following the index for the core curriculum instructional (or teacher materials) for each year.

(c) It was agreed that teachers should be able to selectively order and use additional materials, as needed, from these instructional packets, and in some cases, teachers may choose to do their own local duplicating of certain materials from the instructional packets.

8. Paul Hemp presented some proposed criteria for selection of schools for field testing Basic Core I curriculum materials. The following criteria were recommended by the RAP Advisory Committee:

   (a) Three schools will be selected from each IAVAT district, making a total of fifteen, from among a list of volunteers, who will be solicited at the Annual IAVAT Conference. These volunteers will be screened and a final selection of the 15 schools will be made by the Illinois Joint Staff in Agricultural Occupations.

   (b) The 15 field test teachers should include, if possible, five first-year teachers, five second-year teachers, and five teachers with more than five years of experience.

   (c) Teachers must be willing to spend at least 14 weeks in each semester, teaching the Basic Core I curriculum, using the core curriculum materials.

   (d) The field test teachers, and their local administrators, must be willing to submit their evaluation of the core program and materials and,

   (e) The field test teachers should be willing to meet with the RAP Program Leader and other field test teachers on a district basis to discuss the results of the test.

9. The next meeting of the RAP Advisory Committee was scheduled for Friday, August 22, 1980, at Urbana. A mid-winter meeting and a meeting in late spring, 1981, were tentatively planned.

Leon A. Mayer,
Rural Agriculture Program Leader

MINUTES OF THE METROPOLITAN AGRICULTURE PROGRAM ADVISORY COMMITTEE MEETING OF APRIL 16, 1980

1. Attendance: The following persons attended the first meeting o the M.A.P. Advisory Committee at the Talisman Club, Elgin, Illinois, from 8 a.m. to 2 p.m.

    a. Committee members present were:

    Paul Chase
    Peter Orom
    Kenneth Gallt
    Pam Wolf
    Lou Schairer
    Jim Phelps
    Carl Reed
    Marcia Eberwine
    Emiel Hamberlin

    b. Project staff present were:

    Dr. Paul Hemp
    Jim Ethridge
    Carolyn Sands

2. Paul Hemp presented an overview of the core curriculum project plan for this year.

3. Paul Hemp, Lou Schairer, and Jim Ethridge presented progress reports on project activities to date as follows:

    a. Visits by project staff and other to observe core curriculum programs in Cleveland, Ohio, in Philadelphia, Pennsylvania and in Flushing, New York.

    b. Samples of curriculum outlines used in these metropolitan areas were distributed.

    c. A survey of Illinois metro horticulture teachers to ascertain their perceptions regarding the relative importance of selected areas of course content for secondary programs.

4. Carolyn Sands, Project Research Associate, reported on a study she has completed on employment needs for agricultural occupations in Illinois. Upon analysis of the report (detailed copy to be made available), the M.A.P. Advisory Committee made the following observations:

   a. The large scope and variety of agriculture in Illinois gives rise to many opportunites for entry-level employment in the agricultural occupations in Illinois. Prospects for employment in supply and service and in horticulture seem to be especially promising, implying the need for high schools to conduct occupational education programs in these areas; however, it was noted that some of the non-farm agricultural occupations jobs require specialized education at the post-high school level.

   b. The success of community college agriculture programs depends in large part upon the development and maintenance of strong programs of feeder high schools.

5. The M.A.P. Advisory Committee was asked to react to a list of job titles for the agricultural occupations, derived from the U.S. Labor Department Dictionary of Occupational Titles, to identify typical job titles for Illinois agricultural occupations, which might be used as a basis for a proposed competency study to be used as a partial basis for curriculum content for the core curriculum project. Typical job titles for the seven agricultural occupations areas were tentatively identified and clustered into broad occupational areas. This list of job titles were to be further refined by the advisory council members, and validated through consultation,

with individual M.A.P. advisory committee members; and the final list of job titles is to reported at the next meeting of the M.A.P. Advisory Committee, along with a progress report on the competency study, based upon these job titles.

6. A consensus was reached regarding the purposes to be served by high school horticultural/agricultural occupations programs in Illinois. It was agreed that high school programs of horticultural/agricultural occupations in Illinois should be multi-purpose programs, which would include the following purposes:
    a. To provide career awareness, career orientation, and career exploration, to all who are interested.
    b. To provide a broad background of education in agricultural knowledges and skills to prepare all students enrolled in the program to engage in job preparation for a specific job or further education in the horticultural/agricultural occupations.
    c. To deliberately and systematically provide leadership and citizenship education for all students enrolled in high school agricultural occupations programs.
    d. To provide occupational education to prepare students, who have been able to make a career choice, with entry-level qualifications for specific horticultural/agricultural occupations of jobs.
7. It was agreed that the core curriculum program for Illinois could be structured into three-year program as follows:
    a. Basic core I would be a program core, consisting of common learnings for all students.

b. Courses for the second and third year could be additional classroom preparation or on-the-job-preparation.

It was noted that several metropolitan horticulture/agriculture programs currently permit only two-year programs and most programs require a prerequisite biology courses prior to entering the horticulture/agriculture sequence of courses.

8. The next meeting is scheduled for May 28, 1980 at Elgin.

Jim Ethridge
Metropolitan Agriculture Program Leader

MINUTES OF THE METROPOLITAN AGRICULTURE PROGRAM ADVISORY COMMITTEE MEETNG OF MAY 28, 1980

1. Attendance: The following persons attended the second meeting of the M.A.P. Advisory Committee, at the Talsman Club, Elgin, Illinois, from 8:00 A.M. to 2:00 P.M. on May 28, 1980.

    a. Committee members present:

        (1) Jim Phelps
        (2) Lou Schairer
        (3) Carl Reed
        (4) Pam Wolf
        (5) Marcia Eberwine
        (6) Peter Orum
        (7) George Schuman
        (8) Frank Kane

    b. Project staff present:

        (1) Dr. Paul Hemp, Project Co-director
        (2) Dr. Roger Courson, Project Co-director
        (3) Carolyn Sands, Research Associate
        (4) Jim Ethridge, M.A.P. Program Leader

2. Minutes of the first meeting of April 11, 1980 were approved as written.

3. Paul Hemp presented a summary report of the survey of Illinois Metropolitan Horticulture teachers regarding course content for Core I and Core II courses in agriculture/horticulture. A summary of these ratings have been presented in another section of this report.

4. Carolyn Sands presented a report of a competency study based upon required competencies specified by the Dictionary of Occupational Titles and the National Agricultural Competency Study for selected job titles identified by the M.A.P. Advisory Committee. The Agricultural Occupations taxonomy areas of agricultural production (.01), agricultural supplies and service (.02), agricultural mechanics (.03), agricultural products (.04), ornamental horticulture (.05), agricultural resources (.06), and forestry (.07) were included in this review. In this study, a competency was considered to be a common competency for purposes of inclusion in the core curriculum if this competency was required by one-third of the job titles studied with each of the seven agricultural occupations taxonomy areas. Common competencies were listed for the seven taxonomy areas. A summary of the common competencies identified, and a list of suggested affective work competency clusters are included in another section of this report.

5. Jim Ethridge presented a list of sources to be used in determining curriculum content for the core curriculum program as follows:
   (a) Sample copies of course outlines now in use.
   (b) The survey of opinions of Illinois agricultural occupations teachers regarding the relative importance of selected areas of core curriculum content.
   (c) The curriculum content of core curriculum programs in other states visited and studied.
   (d) The competency study completed as a part of Illinois Core Curriculum Project.

(e) The National Agricultural Competency Study.

(f) The best judgment of the Core Curriculum Project Staff.

(g) The recommendations of the Core Curriculum Project Metropolitan Agriculture Program Advisory Committee.

Based upon these seven sources listed above, the following components of course content, expressed as units and problem areas, were identified by the M.A.P. Advisory Committee for the Basic Core I course for the Core Curriculum Program.

Unit A: Orientation & Guidance

Problem Areas

1. Developing awareness of school and program policies.
2. Communicating classroom policies, laboratory policies, and non-school laboratory policies.
3. Getting acquainted with and succeeding in high school.
4. Getting acquainted with the local school vocational agriculture/horticulture program.
5. Discovering career opportunities in horticulture/agriculture occupations.
6. Understanding the nature, scope and importance of agriculture.

Unit B: Establishing Students in Careers

Problem Areas

1. Determining occupational career opportunities.
2. Determining preparation requirement for specific occupations.
3. Organizing career goals and objectives.
4. Determining avocational interests.

5. Establishing an occupational career preparation program.

Unit C: Leadership in Horticulture/Agriculture

Problem Areas

1. Understanding the National Junior Horticulture Association (NJHA).
2. Understanding FFA as a part of vocational horticulture/agriculture.
3. Developing basic parliamentary skills.
4. Developing basic public speaking ability.
5. Developing basic demonstration methods.
6. Learning to work effectively on committees.
7. Planning a local program of activities.
8. Developing the individual students.
9. Conducting recognition programs.

Unit D: Crop Production

Problem Areas

1. Judging quality of crops for market.
2. Selecting crops.
3. Scheduling crops.
4. Keeping crop production records.
5. Preparing for planting.
6. Planting crops.
7. Managing greenhouse crops.
8. Identifying greenhouse crops; house plants, annuals and perennial herbaceous plants.

Unit E: Animals

Problem Areas

1. Identifying classes and breeds of animals.
2. Feeding and caring for animals.
3. Fitting animals for show.
4. Handling and caring for animals.

Unit F: Supervised Occupational Experience Programs

Problem Areas

1. Understanding supervised occupational experience as an integral part of vocational horticulture/agriculture.
2. Planning a supervised occupational experience program.
3. Keeping records on a supervised occupational experience program.

Unit G: Horticultural/Agricultural Mechanics

Problem Areas

1. Identifying, fitting, and using hand tools.
2. Using selected power tools.
3. Understanding and practicing safety in horticulture/agriculture mechanics.
4. Developing basic carpentry tools.
5. Operating, adjusting and maintaining horticultural equipment.
6. Operating a tractor.
7. Operating lawn & garden tractors.
8. Operating lawn mowers and related equipment.
9. Operating sprayers, spreaders, and dusters.
10. Operating a steam sterilizer.
11. Operating tractor equipment.

12. Using and caring for trucks and fork lifts.

Unit H: Conservation of Soil, Water and other Natural Resources

Problem Areas

1. Conserving energy.
2. Collecting and testing soils and making recommendations.

Unit I: Sexual Plant Propagation

Problem Areas

1. Identifying seeds.
2. Care, handling and storing herbaceous & wood seeds.
3. Caring for and transplanting seedlings.

Unit J: Asexual Plant Propagation

Problem Areas

1. Propagating by cuttings.
2. Propagating by layerage.
3. Propagating by division.
4. Propagating by budding.
5. Propagating by grafting.
6. Propagating by meristem tip culturing.

Unit K: Soils (plant growth media)

Problem Areas

1. Identifying the properties and nature of soils.
2. Identifying soil amendments and functions.
3. Using soil management techniques.
4. Mixing and using greenhouse soils.
5. Determining physical and chemical features of soils and soil mixes.

6. Artificial soils.
7. Soil sterilizing methods.

Unit L: Fertilizers

Problem Areas

1. Identifying components of fertilizers and fertilizer types.
2. Using organic fertilizers.
3. Using inorganic fertilizers.
4. Applying fertilizers to greenhouse, nursery, landscape and turf situations.

Unit M: Citizenship

Problem Areas

1. Identifying responsibilites of citizenship
2. Developing traits of a good citizen.
3. Participating in community service projects.
4. Expressing opinions to the public.

Units N: Controlling Artificial Plant Environments

Problem Areas

1. Operating watering systems.
2. Maintaining watering systems.
3. Operating lighting systems.
4. Operating shading systems.
5. Operating heating systems.
6. Identifying structures.

Unit O: Retail Floriculture

Problem Areas

1. Constructing basic floral designs.
2. Making corsages.

3. Making a floral arrangement.
4. Making a hanging basket.
5. Making wreaths.
6. Arranging fruit baskets.
7. Conditioning and storing floral products.
8. Decorating potted plants.
9. Selling products.

Unit P: Producing Vegetable Crops

Problem Areas

1. Preparing a garden plan.
2. Keeping accurage records.
3. Preparing the soil.
4. Establishing the vegetable crop.
5. Maintaining the vegetable crop.
6. Preparing vegetables for exhibition.
7. Harvesting the vegetable crops.
8. Identifying vegetable crops.

Unit Q: Producing Nursery Stock

Problem Areas

1. Planting nursery stock.
2. Watering nursery stock.
3. Pruning nursery stock.
4. Growing nursery stock in containers
5. Controlling weeds, diseases, insects and other pests.
6. Cultivating nursery stock.
7. Digging nursery stock.
8. Protecting nursery stock from environmental damage.

9. Identifying woody plant species.

Unit R: Establishing the Landscape

Problem Areas

1. Taking and evaluating a soil test.
2. Planting trees, hedges, shrubs, screen, ground covers.
3. Preparing a planting bed.
4. Planting in the landscape.

Unit S: Maintaining the Landscape

Problem Areas

1. Fertilizing landscape plants.
2. Pruning landscape plants.
3. Watering landscape plants.
4. Mulching landscape plants.
5. Protecting landscape plants from environmental damage.

Unit T: Establishing Turf

Problem Areas

1. Preparing the seed bed.
2. Selecting grass seed.
3. Sowing grass seed.
4. Laying sod.
5. Identifying turf grass species.

Unit U: Maintaining Turf

Problem Areas

1. Mowing turf.
2. Fertilizing turf.
3. Watering turf.

4. Controlling turf diseases, insects, weeds and other pests.
5. Renovating turf.

Unit V: Producing Fruits

Problem Areas

1. Preparing a fruit plot plan.
2. Keeping accurate records.
3. Establishing a fruit planting.
4. Preparing for planting.
5. Growing brambles.
6. Growing tree fruits.
7. Growing vine crops.
8. Growing strawberries, shrub fruits.
9. Maintaining the fruit planting.
10. Controlling & identifying insects, diseases, weed and other pests.
11. Identifying fruit crops.

Unit W: Plant Identification and Classification

Problem Areas

1. Identifying and classifying plants.
2. Identifying different portions of the leaf.
3. Identifying different types of stems.
4. Identifying different types of fruits.
5. Identifying structures of the flowers.
6. Identifying conifers & their cones.
7. Identifying grasses.
8. Identifying root systems.

6. Two sample packets of instructional materials for the core curriculum program were presented by Paul Hemp. The M.A.P. Advisory Committee recommended that the following format be used in preparing instructional packets:

Components of an Instructional Packet

1. Teacher's guide
    a. Suggested interest approaches
    b. Objectives
    c. Problems and concerns
    d. Suggested teaching activities
    e. Application to F.F.A., S.O.E., etc.
    f. Evaluation procedures
    g. References and aids
2. Job sheets
3. Assignment sheets
4. Transparencies
5. Test questions
6. Suggested demonstrations
7. Student materials (subject matter units, charts or other study materials)

7. Paul hemp presented some proposed criteria for selection of schools for field testing Basic Core I curriculum materials. The following criteria were recommended by the M.A.P. Advisory Committee:

    1. Five high schools will be selected to field test the Core I units during the 1980-81 school year.

2. The following criteria will be used in selecting schools and/or teachers.
    a. Five schools located in the Chicago Metro Area will be selected.
    b. Preferred teachers will have two years of teaching experience and be willing to teach the units designated for Core I to their beginning students.
    c. Administrators and teachers must be willing to work with the MAP Leader to evaluate the units taught.
    d. Teachers must be willing to meet with the MAP Leader on an individual or group basis to discuss the results of field test trials.
3. A proposed schedule of activities for the field test program includes the following:
    a. Nominations and/or volunteer for field testing program will be obtained in June, 1980.
    b. Project staff selects five field test schools in July.
    c. Orientation meeting of five field test teachers will be held in late July.
    d. Instructional packets for fall semester will be delivered to field test schools in early August.
    e. Evaluation sheets will be provided to all field test teachers in August.
    f. MAP Leader will visit or meet with field test teachers on a monthly basis to secure feedback on the instructional packets and to provide assistance in the use of the packets.

g. Instructional packets for spring semester, 1981, will be delivered to the field test schools in December, 1980.

4. Additional plans and implementation procedures are as follows:
   a. Instructional packets including student materials will be furnished to schools on a no-cost basis.
   b. Field test teachers will be asked to devote at least 14 weeks of each semester to the teaching of the proposed core units. The remainder of the semester may be used to teach other unit selected by the local teacher.

8. The next meeting of the M.A.P. Advisory Committee was scheduled for the third week of September. The location, time and specific date to be determined after the selection of schools for testing the core.

Jim Ethridge
Metropolitan Agriculture Program Leader

WORKSHOP PLANS

In order to inform agricultural occupations teachers about the core curriculum project and to provide potential field test teachers with an overview of the field test plans, two activities were scheduled for June, 1980.

An oral presentation of the project was scheduled as a part of the Annual IAVAT Conference to be held at Urbana in June. Approximately 300 teachers usually attend this conference.

A second activity planned during this same conference was an orientation workshop for those teachers who are interested in serving as field test teachers during the 1980-81 school year. Sectional chairpersons of the IAVAT and RAP and MAP Advisory Committees were asked to notify teachers of the opportunity to help field test the instructional packets. An announcement was scheduled to be made during the initial general session of the IAVAT Conference to invite all interested teachers to attend the orientation workshop.

The following criteria and guidelines for selecting and working with the RAP field test teachers will be used:

1. Fifteen high schools will be selected to field test the Core I units during the 1980-81 school year.
2. The following criteria will be used in selecting schools and/or teachers.
    a. Three schools located in close proximity will be selected in each of the five IAVAT districts.
    b. Teachers who were qualified at each of the four teacher education institutions will be selected.
    c. Beginning teachers, teachers in their second year of teaching and experienced teachers will be selected.
    d. Administrators and teachers must be willing to work with the RAP Leader to evaluate the units taught.
    e. Teachers must be willing to meet with the RAP Leader on an individual or district basis to discuss the results of field test trials.

Five schools and field test teachers in metropolitan areas will be selected to field test instructional packets for the metropolitan core program. School location, teaching experience and educational background will be considered in selecting field test teachers in metropolitan areas. Guidelines for working with the MAP field test teachers will be essentially the same as the guidelines listed for the RAP teachers.

Final selections of all field test teachers will be made by the Illinois Joint Staff from those teachers who attend the orientation workshop in Urbana in June, 1980.

PUBLICITY AND DISSEMINATION ACTIVITIES

The project was publicized through announcements and progress reports in the Vo Ag Aids, a state newsletter for agricultural occupations teachers in Illinois. Also, announcements and reports were made at Illinois Joint Staff meetings, Illinois Vocational Association Convention, and the Illinois Association of Vocational Agriculture Teachers Conference. Additional publicity was provided through a mailed survey of instructional materials needed by teachers which was sent to all agricultural occupations teachers in Illinois and a survey of what units to include in the core curriculum which was sent to 50 teachers in Illinois.

During Phase I, no products were produced in final form. Copies of the Phase I Final Report were distributed to project staff, advisory committee members and field test teachers and the Department of Adult, Vocational and Technical Education, Illinois State Board of Education.

SUMMARY AND FUTURE PLANS

Activities planned for Phase I of this project have been completed on schedule. Program objectives and recommended program models have been identified and described for both the rural agriculture program core and the metropolitan agriculture program core. Tentative content for the first year of the RAP and MAP core has been identified. The framework for organizing content into vocational program models includes three levels of specificity:

1. Program core--content to be taught to all students during the first two years (9th and 10th grade levels).
2. Specialized core--content specific to a taxonomic area such as agribusiness, horticulture, or agricultural mechanics which could be taught during the 11th or 12th grade levels.
3. Job core--content specific to a particular occupation which would be taught to those 11th and 12th grade students who plan to enter the labor market immediately after high school graduation.

The secondary school curriculum should include core materials at all three levels in order to serve all students and meet their vocational education needs.

During Phase I, core content has been identified using the following sources of knowledge:

1. Employment needs research
2. Competency studies
3. Systematic survey of teachers
4. Information gained from visits to other states
5. Review of course outlines and materials
6. Recommendations of RAP and MAP Advisory Councils
7. Information provided by project staff

The specific objectives of Phase II (July 1, 1980 - June 30, 1981) of this project are as follows:

1. To develop a list of units and problem areas to be included in the first two years of the RAP core curriculum.
2. To develop a list of units and problem areas to be included in the first one or two years of the MAP core curriculum.

3. To prepare and field test all of the instructional packets for the first year of the RAP core curriculum and at least half of the instructional packets for the first one or two years of the MAP curriculum.
4. To revise all of the instructional packets referred to in Objectives 2 and 3 based on field test and other evaluations.
5. To complete two program planning guides, one for RAP and one for MAP.
6. To begin the development of instructional packets for the last two years of the RAP and MAP core curriculum.
7. To publish a sufficiet quantity of program planning guides and instructional packets developed in Phase II to disseminate to all Illinois agricultural occupations teachers during July and August, 1981.

RESOURCE MATERIALS

The following resource materials were received for the project:

Cornell University

Vocational Horticulture Record Book
Experience in Ornamental Horticulture
Greenhouse Soils
Handling and Restraining Techniques for Pets and Lab Animals
Horticulture Tool Identification Sheets
Veterinary Records and Office Procedures
Exploring Small Animal Care
Conservation Careers
Management of Forest Resources for Multiple Use-Student Resource Unit
Careers in Wildlife Conservation
The Farmer and Wildlife
Planning Agricultural Conservation Systems
Turfgrass Maintenance and Establishment - Teachers Manual
Soil and Water Conservation - What, Why, How
Small Engines - Student Handbook
Erosion, Sedimentation, and Environment Qual.
Using Power Mowers Safely

Keeping Records Straight
Credit
Savings and Checking Accounts
Budgeting and Spending
Building an Insurance Program
Agricultural Business Money Management
Agricultural Business Procedures and Record
Opportunities in Agricultural Occupations
You and Your Job-Student Handbooks
You and Your Job-Guide for Instructors
getting and Holding a Job-Packaged Unit

California Polytechnic State University, San Luis Obispo, California

Use of the Level: Setting Up the Instrument (siletn filmstrip)
Use of the Level: Reading the Rod (silent filmstrip)
Weights and Measures (transparency masters)
Livestock Judging Slide Set
Swine Carcass Evaluation (silent filmstrip)
Agriculture Mechanics: A Course of Study
Small Gasoline Engines: Emphasis on O.E.
Agricultural Mechanics Plans
The Illustrated Tool Identification Manual
The Illustrated Tool Identification Manual Picture Section
Ornamental Horticulture Curriculum Guidelines
Forstry Curriculum Guidelines
Introduction to Agriculture Curriculum Guidelines
Agricultural Production - Vol. 1 - Curriculum Guidelines

University of Georgia, Athens, Georgia

Electric Wiring Publications
Electric Wiring Teacher Guide
Electric Wiring Student Workbook
Selecting and Storing Fuels & Lubricants-Transparency Masters and Publication
Tractor Maintenance Principles and Procedures Teacher Guide
Tractor Maintenance Principles and Procedures Student Workbook
Care of Operation of Small Engines Vol. I
Care and Operation of Small Engiens Vol. II.

Iowa State University, Ames, Iowa

Crop Production
Automatic Controls
Small Power Equipment

University of Missouri, Columbia, Missouri

Instructors Guide to SOEP in Vo-Ag Production
Student Reference to SOEP for Vo-Ag Production
Farm Crops Identification and Judging
Instructors Guide to SOEP for Vo-Ag Placement

Student Reference for SOEP for Vo-Ag Placement
Parliamentary Procedure for Youth Organizations (2)
Plant Science Unit (2)
Applying Pesticides
Small Grains Unit
Soils Unit (2)
Advanced (Semester) Corn and Sorghum Prod.
Advanced (Semester) Soybean Prod.
Advanced (Semester) Forage Unit
Animal Breeding Unit Guide (2)
Animal Nutrition Unit Guide (2)
Careers I Unit Guide
Leadership Unit I Guide
Swine Unit Guide (2)
Advanced (Semester) Beef Production
Advanced (Semester) Swine Production (2)
Advanced (Semester) Dairy Production (2)
Soil Erosion and Sediment Pollution Control (2)
Soils Unit: Instructor's Guide
Oxy-Acetylene Welding
Arc Welding
Agriculture Shop Safety
Power Tool Safety and Operation
Internal Combustion Engine
Basic Electricity
Agricultural Management & Economics
Principles of Agricultural Mgt. Decision Making
Horticulture Contests
Operating Tractors for Groundskeeping & Orn. Hort.
Parliamentary Procedure Staudy Manual & Tests
Parliamentary Procedure Transparencies

The Ohio State University, Columbus, Ohio

Plant Growth and Development-Teachers Guide
Grain Marketing-Teachers Supplement
Landscaping Your Home-Teachers Guide
Teaching Tree Identification-Teachers Guide
Demonstrations and Related Information for Teaching Electricity and Electric Wiring
Career Exploration in Agribusiness, Renewable Natural Resources, and Environmental Prot.
Career Prep. in Ag. Supply & Service
Career Prep. in Ag. Equipment & Mech.
Career Prep. in Orn. Hort.
Career Prep. in Ag. Resources
Agricultural Business Curr. Guide
Agricultural Industrial Equipment & Service Curriculum Guide
Small Animal Production Mgt. Curr. Guide
Ohio Model Course of Study for Prod. Ag. - 9-12
Model Course of Study for Voc. Hort. - 11-12
Vocational Hort. Record Book
Occupational Opportunities in Environmental Mgt.

Judging Land and Soil for Agricultural Use
Livestock Nutrition and Feeding
Insect, Tick and Mite Pests of Livestock and Pets
Grain Marketing-Students Manual
Marketing Agricultural Products
Agricultural Business Procedures and Records
Teachers Answer Supplement and Guide for Agricultural Business Supply and Service
Transparency Masters for Agricultural Business Supply & Service
Horse Management Curriculum Guide

State Department of Vocational & Technical Education, Stillwater, Oklahoma

Basic Core Curriculum Guide for Vocational Agriculture I - Teacher
Basic Core Curriculum Guide for Vocational Agriculture II - Teacher
Basic Core Curriculum Guide for Vocational Agriculture III - Teacher
Basic Core Curriculum Guide for Vocational Agriculture IV - Teacher
Agriculture Careers - Teachers
Agriculture Occupations Handbook
Vocational Agriculture Mechanics - Teachers
Horticulture I - Teacher
Horticulture II - Teacher
Group Instruction for Cooperative Programs

The Pennsylvania State University, University Park, PA

Agricultural Products I, A Teachers Manual (2)
Horticultural Mechanics Course Outline
Suggested Ornamental Horticulture Course
Outline of Courses in Ornamental Horticulture
Planning for a Career in Agricultural Agribusiness - Teachers Guide
Management of Forest Resources for Multiple Use - Teachers Manual
Land Use and Management Program
Managing an Agricultural Supply Business Simulation
Energy Conservation in the Home and on the Farm, 1980
Greenhouse Crop Production Record Book, 1980

Texas A & M University, College Station, Texas

V.A. I Technical Information (2)
V.A. II Technical Information (2)
V.A. III Technical Informatin (2)
V.A. IV Technical Information (2)
Judging Horses - 2 classes of mares and 2 classes of geldings
Breeding Swine Evaluation & Swine Slaughter Grading
Group Instruction Handbook-Cooperative Part-tiem Training

Horticulture Occupations
Horse Farm Employee

Western Illinois University, Macomb, Illinois

Agricultural Equipment Parts Salesperson
Floriculture Worker
Gardener/Groundskeeper
Meat Cutter
Nursery Worker
Retail Flower Shop Salesperson & Floral Des.
Small Engeine Repairer
Tractor Mechanic
Turfgrass Maintenance Worker
Agricultural Occupations in Illinois
Five Year and Annual State Plan for Vocational Education in Illinois
Metric Implementation Guide A, Agricultural Occupations

Indiana State University, Terre Haute, Indiana

Leadership Training Units for Vocational Youth
Junior High Skill Activities in Agriculture
Vocational Agribusiness in Indiana: Agribusiness I
Vocational Agribusiness in Indiana: Agribusiness II
Advanced Livestock Production

Clemson University, Clemson, South Carolina

Agricultural Mechanics
Exploring Agriculture
Ornamental Horticulture
Agricultural Sales & Service
Agricultural Electricity-Teacher Guide Electric Motors
Agricultural Electricity-Teacher Guide Electric Controls
Soil Classification and Treatment
Agricultural Electricity-Electric Controls-Complete Set
Salesmanship-Transparencies

APPENDICES

Sequence # ____________________

A STUDY OF THE IMPORTANCE OF SELECTED INSTRUCTIONAL AREAS TO BE INCLUDED IN THE FIRST AND SECOND YEAR OF THE CORE CURRICULUM

1. a. The following instructional areas are divided into two parts - A and B. Please respond to both parts by circling the number which indicates the degree of importance you place on each of the following instructional areas.

   b. Please indicate if this is presently part of your current program by circling "1" for yes or "2" for no.

	LEVEL OF IMPORTANCE					Is this part of your current first and second year program?	
INSTRUCTIONAL AREAS	Most Important				Least Important	Yes	No
ANIMAL SCIENCE							
Part A.							
a. Beef	1	2	3	4	5	1	2
b. Dairy	1	2	3	4	5	1	2
c. Domestic Animals (house pets)	1	2	3	4	5	1	2
d. Goats	1	2	3	4	5	1	2
e. Horses	1	2	3	4	5	1	2
f. Livestock Specialty (bees, rabbits, fish, etc.)	1	2	3	4	5	1	2
g. Poultry (chickens, ducks, pigeons, etc.)	1	2	3	4	5	1	2
h. Sheep	1	2	3	4	5	1	2
i. Swine	1	2	3	4	5	1	2
Part B.							
a. Breeding and Management	1	2	3	4	5	1	2
b. Careers in the Livestock Industry	1	2	3	4	5	1	2
c. Feeding and Nutrition	1	2	3	4	5	1	2
d. Housing and Equipment	1	2	3	4	5	1	2
e. Livestock Health	1	2	3	4	5	1	2
f. Livestock Judging and Showing	1	2	3	4	5	1	2
g. Livestock Marketing	1	2	3	4	5	1	2
h. Livestock Selection and Identification	1	2	3	4	5	1	2
PLANT SCIENCE							
Part A.							
a. Corn	1	2	3	4	5	1	2
b. Forage Crops	1	2	3	4	5	1	2
c. Grain Sorghum	1	2	3	4	5	1	2
d. Oats	1	2	3	4	5	1	2
e. Soybeans	1	2	3	4	5	1	2
f. Speciality Crops (garden vegetables and truck crops)	1	2	3	4	5	1	2
g. Wheat	1	2	3	4	5	1	2
Part B.							
a. Careers in Plant Science	1	2	3	4	5	1	2
b. Harvesting and Storage	1	2	3	4	5	1	2
c. Insect and Disease Control	1	2	3	4	5	1	2
d. Judging Crops and Showing	1	2	3	4	5	1	2
e. Marketing Crops	1	2	3	4	5	1	2
f. Plant Growth and Development	1	2	3	4	5	1	2
g. Plant Nutrition	1	2	3	4	5	1	2
h. Seedbed Preparation	1	2	3	4	5	1	2
i. Tillage Equipment	1	2	3	4	5	1	2
j. Variety Selection and Seeding Practices	1	2	3	4	5	1	2
k. Weed Control	1	2	3	4	5	1	2

	LEVEL OF IMPORTANCE					Is this part of your current first and second year program?	
INSTRUCTIONAL AREAS	Most Important				Least Important	Yes	No
HORTICULTURE							
Part A.							
a. Aboriculture (trees and shrubs)	1	2	3	4	5	1	2
b. Apiculture (bees)	1	2	3	4	5	1	2
c. Floriculture (flowers)	1	2	3	4	5	1	2
d. Greenhouse Operation and Management	1	2	3	4	5	1	2
e. Landscaping	1	2	3	4	5	1	2
f. Nursery Operation and Management	1	2	3	4	5	1	2
g. Olericulture (vegetables)	1	2	3	4	5	1	2
h. Pomology	1	2	3	4	5	1	2
i. Retail Sales	1	2	3	4	5	1	2
j. Turf Management	1	2	3	4	5	1	2
Part B.							
a. Care of Plants	1	2	3	4	5	1	2
b. Careers in Horticulture	1	2	3	4	5	1	2
c. Greenhouse Environment	1	2	3	4	5	1	2
d. Greenhouse Practices	1	2	3	4	5	1	2
e. Horticultural Judging Skills	1	2	3	4	5	1	2
f. Horticultural Mechanics	1	2	3	4	5	1	2
g. Insect and Disease Control	1	2	3	4	5	1	2
h. Landscape Planning	1	2	3	4	5	1	2
i. Landscape Plants and Structures	1	2	3	4	5	1	2
j. Nursery Practices	1	2	3	4	5	1	2
k. Plant Growth and Development	1	2	3	4	5	1	2
l. Plant Identification	1	2	3	4	5	1	2
m. Plant Propagation	1	2	3	4	5	1	2
n. Planting and Transplanting	1	2	3	4	5	1	2
o. Plants for Holidays	1	2	3	4	5	1	2
p. Showing Horticulture Plants	1	2	3	4	5	1	2
q. Soils in the Nursery and Greenhouse	1	2	3	4	5	1	2

(Please continue on back of page)

2. a. Please circle the number that indicates the level of importance you would place on the selected instructional areas for the first and second year students in a core curriculum program.

b. Please indicate if these instructional areas are currently being taught to your first or second year students by circling "1" for yes or "2" for no.

	LEVEL OF IMPORTANCE					Is this part of your current first and second year program?	
INSTRUCTIONAL AREAS	Most Important				Least Important	Yes	No
SOIL SCIENCE							
a. Land-use Selection	1	2	3	4	5	1	2
b. Soil Components	1	2	3	4	5	1	2
c. Soil Nutrients & Fertility	1	2	3	4	5	1	2
d. Soil Formation	1	2	3	4	5	1	2
e. Soil Erosion & Conservation	1	2	3	4	5	1	2
f. Soil pH	1	2	3	4	5	1	2
g. Surveying and Legal Land Description	1	2	3	4	5	1	2
LEADERSHIP							
a. F.F.A.	1	2	3	4	5	1	2
b. Occupational Survival Skills	1	2	3	4	5	1	2
c. Parliamentary Procedure	1	2	3	4	5	1	2
d. Program of Activities	1	2	3	4	5	1	2
e. Public Speaking	1	2	3	4	5	1	2
AGRIBUSINESS AND RECORDS							
a. Ag. Math and Metric Measurement	1	2	3	4	5	1	2
b. Careers in Ag. Supplies and Services	1	2	3	4	5	1	2
c. Orientation to Agriculture	1	2	3	4	5	1	2
d. Recordkeeping Procedures	1	2	3	4	5	1	2
e. Supervised Occupational Experience Programs	1	2	3	4	5	1	2
f. S.O.E. Production Problem (Tom Farmer)	1	2	3	4	5	1	2
g. S.O.E. Agribusiness Problem	1	2	3	4	5	1	2
h. S.O.E. Horticulture Problem	1	2	3	4	5	1	2
MECHANICS							
a. Agriculture Power	1	2	3	4	5	1	2
b. Agriculture Implements and Machinery	1	2	3	4	5	1	2
c. Careers in Agriculture Mechanics	1	2	3	4	5	1	2
d. Concrete and Masonery	1	2	3	4	5	1	2
e. Drafting and Planning Projects	1	2	3	4	5	1	2
f. Electricity	1	2	3	4	5	1	2
g. Home Shop Development	1	2	3	4	5	1	2
h. Plumbing	1	2	3	4	5	1	2
i. Project Construction and Structures (wood and metal)	1	2	3	4	5	1	2
j. Shop Safety	1	2	3	4	5	1	2
k. Soldering	1	2	3	4	5	1	2
l. Surveying	1	2	3	4	5	1	2
m. Tool Identification & Fitting (hand & power)	1	2	3	4	5	1	2
n. Welding and Metals	1	2	3	4	5	1	2

	LEVEL OF IMPORTANCE					Is this part your current and second y program?	
INSTRUCTIONAL AREAS	Most Important				Least Important	Yes	No
AGRICULTURAL PRODUCTS							
a. Careers in Agricultural Products	1	2	3	4	5	1	2
b. Dairy Products Judging	1	2	3	4	5	1	2
c. Dairy Processing	1	2	3	4	5	1	2
d. Fruit and Vegetable Processing	1	2	3	4	5	1	2
e. Grain and Grain-By Products	1	2	3	4	5	1	2
f. Meat Judging and Grading	1	2	3	4	5	1	2
g. Meat and Meat-By Products	1	2	3	4	5	1	2
h. Non-Food Products	1	2	3	4	5	1	2
RESOURCES AND FORESTRY							
a. Careers in Forestry	1	2	3	4	5	1	2
b. Careers in Resources	1	2	3	4	5	1	2
c. Ecology	1	2	3	4	5	1	2
d. Energy Conservation	1	2	3	4	5	1	2
e. Erosion	1	2	3	4	5	1	2
f. Forests	1	2	3	4	5	1	2
g. Pollution of Natural Resources	1	2	3	4	5	1	2
h. Recreation	1	2	3	4	5	1	2
i. Wildlife	1	2	3	4	5	1	2

3. a. Are there areas you currently teach to your first and second year students which are not mentioned in the questionnaire?

Yes 1
No. 2

b. If yes, specify; ______________________

4. Including this year, how many years have you been teaching in public schools?

Less than 1 year. 1
1 thru 4 years. 2
5 years or more 3

5. Are you currently a member of the I.A.V.A.T.?

Yes 1
No. 2

6. Is your high school enrollment more or less than 1,000 students?

More than 1,000 1
Less than 1,000 2

THIS CONCLUDES THE QUESTIONNAIRE. THANK YOU FOR YOUR COOPERATION. YOUR ASSISTANCE WILL HELP ASSURE AN ACCURATE STUDY WHICH WILL IN TURN BE USED TO IMPROVE AGRICULTURAL EDUCATION IN ILLINOIS.

APPENDIX B

FFA LEADERSHIP TEACHING AIDS SURVEY

Instructions: Please rank each of the areas numerically according to following scale:

(4) Very Important
(3) Important
(2) Some Importance
(1) Not Needed

Next, please check TYPE OF AID that would be most beneficial to you and add those areas you may feel are needed. (Note example)

		TYPE OF AID					
Rank	Area	Slidefilm	Slide Set with Cassette Narration	Study Guide with Cassette Narration	Transparency	VAS Units	Workbook
3	*(Example)* *Chapter Banquets*		✓				
	Careers						
	Chapter Awards						
	Chapter Banquets						
	Conducting Chapter Meetings						
	Foundation Awards						
	Agri-Business						
	Production						
	Public Speaking						
	History of Illinois FFA						
	Judging Contests						
	Leadership Training						
	Parliamentary Procedure						
	Program of Activities						
	Supervised Occupational Exp. Program						
	Any additional areas of interest						
	1.						
	2.						
	3.						
	etc.						

Please list five aids you use most frequently in teaching FFA leadership areas (Example: FFA Manual, PCA Student Handbook, etc.)

1.
2.
3.
4.
5.

APPENDIX C

THE TAXONOMY OF AGRICULTURE/AGRIBUSINESS EDUCATION

U.S. Office of Education Classification

AGRICULTURE/AGRIBUSINESS

01.00 00 00

Agriculture/Agribusiness programs in Vocational Education are comprised of individuals and group instruction and supervised learning experiences organized in courses, unit courses, and modules designed to develop competencies preparing and upgrading of youth and adults for employment in recognized agriculture/agribusiness occupations. These occupations are classified under the following subject matter areas which are applicable at the secondary, post secondary, and adult levels of instruction: agricultural supplies and services; agricultural mechanics; agricultural products processing and marketing; horticulture; renewable natural resources; and forestry.

The Future Farmers of America (FFA) Organization is a school laboratory in Agriculture/Agribusiness Education at the secondary level, and frequently at the post secondary level. It aids in motivating and involving students in individual and group activities that are integral parts of the instructional program on the local, State and National basis. It develops competencies in leadership, citizenship, community service, scholarships, thrift, cooperation, patriotism, recreation, and careers in Agriculture and Agribusiness Occupations.

Young Farmer Educational Associations (YFEA) are similarly developed and function like FFA in complementing the instructional programs for Young Farmers and other adults enrolled in adult vocational education courses in Agriculture/Agribusiness at the local and State levels.

Instructional Program

PRODUCTION AGRICULTURE 01.01

Subject matter and planned learning experiences which are concerned with the study and operations involved in the planning related to and the economic use of facilities, land water, machinery, chemicals, finance, and labor in the production of plant and animal products. Activities include classroom instruction and laboratory experiences in and out of school, including farms and ranches.

ANIMAL AND POULTRY PRODUCTION 01.0101

Organized subject matter and planned learning experiences which are concerned with the study and operations involved in the production of animal production enterprises. Among the knowledge, skills and other competencies to be acquired are: selection and breeding; genetics; physiology; nutrition; animal health; housing; feeding; management and marketing. The following animal enterprises included are: dairy cattle; beef cattle; horses; swine; sheep; poultry. Other animals not listed above, but emphasized in instruction are: goats; buffalo; and small animals such as mink, rabbits, cats, dogs, earthworms and bees.

CROP PRODUCTION 01.0102

Organized subject matter and planned learning experiences which are concerned with the study and operations involved in Plant Production enterprises. Among the knowledgeable skills and other competencies to be acquired are: soils; nutrition, crop and weed plant and seed identification; genetics; physiology, entomology; plant pathology; and plant disease and pest control, which may include the study of insecticides, fungicides, herbicides, non-chemical controls and plant genetic resistance. The following crop enterprises included are: cereal grain; fiber forage; oil seeds, tree fruits and nuts; small fruits; vegetables and other crops.

FARM MECHANICS 01.0103

A combination of subject matter and activities designed to develop the skill necessary for performing the common operations involving mechanics on a farm and/or ranch. Included are: Selection, operation and maintenance of farm power and machinery; farm structures, equipment and environment; farm electrification, power and controls; farm shop skills, construction and maintenance. Soil and Water Management and mechanical practices.

FARM BUSINESS MANAGEMENT 01.0104

Planned learning activities which are concerned with farm enterprise analysis, accounting, taxes, production, financing capital, resources, purchasing, government programs, farm inputs, performance records, contracts, estate planning and marketing. The results of these learning experiences are designed to be applied by the student in formulating decisions involved in managing farm or ranch operations.

PRODUCTION AGRICULTURE, OTHER 01.0199

Include here other subject matter and experiences in agricultural production not listed or classifiable above.

AGRICULTURAL SUPPLIES/SERVICES 01.02

Subject matter and learning experiences concerned with preparing students for occupations involved in selling supplies used in agricultural production, providing services requiring agricultural knowledge and skills, and the purchasing, grading, storing, transporting and marketing of the products of agricultural production.

AGRICULTURAL BUSINESS MANAGEMENT 01.0201

Planned learning activities concerned with resource analysis, accounting, labor management, financing, purchasing, contracts, business procedures and marketing. The results of these learning activities are applied to formulating decisions involved in managing an agricultural supply and/or service business.

AGRICULTURAL SUPPLIES AND MARKETING 01.0202

Planned learning experiences necessary for employment in agricultural businesses engaged in marketing, purchasing, storing, grading, and transporting supplies and products. Examples include: Feeds, seeds, fertilizers, agricultural chemicals, machinery and parts, and other agricultural supplies. Also included under marketing are livestock, grains and other products produced on farms.

AGRICULTURAL SERVICES 01.0203

Planned learning experiences necessary for employment in agricultural businesses providing services requiring knowledge and skills in agriculture. Examples are: Custom work; equipment operation and maintenance; agricultural management and finance services; small animal services; animal breeding services; and horse-shoeing; pet services and animal hospital services.

AGRICULTURAL SUPPLIES/SERVICES, OTHER 01.0299

Include here other subject matter and experiences emphasized in agricultural supplies/services which are not listed above.

AGRICULTURAL MECHANICS 01.03

A combination of subject matter and learning experiences designed to develop abilities and competencies for successful job entry in occupations performing the common operations involving the selection, operation, maintenance, service, sales, and use of agriculture/agribusiness power units, machinery, equipment, structures, and utilities.

AGRICULTURAL POWER AND MACHINERY 01.0301

A combination of subject matter and learning experiences designed to develop in students the abilities to: 1) Identify the fundamental principles of selection, operation, service, maintenance, repair, and safety in agricultural power units, agricultural machinery and equipment, and 2) acquire the skills and competencies for practical application of subject matter concerned with gas, diesel and electric units; refrigeration; welding; hydraulics and other power systems.

AGRICULTURAL STRUCTURES, EQUIPMENT AND ENVIRONMENT 01.0302

Learning experiences designed to assist students in developing the ability to plan, select materials for, construct, utilize and maintain agricultural structures, equipment and environmental facilities, such as: Barns, grain storage bins, barn cleaners, milking parlors, air conditioner, ventilators, etc.

AGRICULTURAL ELECTRIFICATION, POWER AND CONTROLS 01.0303

A combination of subject matter and practical experiences designed to develop student competencies in the safe use of electricity, electrical power, equipment and automatic controls. (See also 16.010201 AGRICULTURAL ELECTRIFICATION TECHNOLOGY under TECHNICAL EDUCATION.)

AGRICULTURAL MECHANICS, CONSTRUCTION, AND MAINTENANCE SKILLS 01.0304

Planned learning experiences designed to develop skills, abilities and judgments to select, safety use and maintain: hand and power tools; arc and acetylene welders; and construction materials.

SOIL AND WATER MECHANICAL PRACTICES 01.0305

Planned learning experiences designed to develop student competencies in those mechanical practices which implement soil and water management. such practices include: surveying, planning, laying out, constructing, using and maintaining irrigation, drainage, run-off, water conservation, and erosion control systems.

AGRICULTURAL MECHANICS, OTHER 01.0399

Include here other organized subject matter and experiences emphasized in agricultural mechanics which are not listed above.

AGRICULTURAL PRODUCTS, PROCESSING AND MARKETING 01.04

A combination of subject matter and planned learning experiences designed to develop student competencies in processing of food and non-food agricultural products. The knowledge includes: characteristics and properties of farm products. The skills include operations in assembling, transporting, grading, inspecting, processing, fabricating, mixing, manufacturing, packaging, storing, and marketing. Quality control requires knowledge, skills and decision-making competencies.

The groups of food products include: 1) meat and meat products, fish and seafoods, poultry and eggs; 2) dairy products; 3) fruits and vegetables; 4) grain mill and oilseed products, and 5) other food products. The non-food products are cotton, tobacco, wool and other farm crops and livestock products processed for non-food uses.

FOOD PRODUCTS 01.0401

Subject matter and learning experiences concerned with the knowledge, processing skills and mechanical operations involved in the preparation of agricultural products for sale and consumption. (Included as 16.0203 FOOD PROCESSING TECHNOLOGY under TECHNICAL EDUCATION.)

NON-FOOD PRODUCTS 01.0402

Subject matter and learning experiences concerned with the knowledge, skills and mechanical operations in the processing of non-food products, such as: cotton, tobacco and wool.

AGRICULTURAL PRODUCTS PROCESSING AND MARKETING, OTHER 01.0499

Other organized subject matter and learning experiences for students who may enter employment in agricultural products processing/marketing not classified or listed above.

HORTICULTURE 01.05

Organized subject matter and practical experiences concerned with production, processing, marketing and services involving plants, shrubs and trees used principally for ornamental, recreational and aesthetic purposes. Students qualify for entry and career advancement in horticultural occupations. Instruction emphasizes knowledge and skills important to establishing, maintaining and managing horticultural enterprises, including machinery and equipment necessary to each enterprise. Subject matter and learning experiences are organized under descriptive titles including Arboriculture, Floriculture, Greenhouse Operation and Management, Landscaping, Nursery Operation and Management, Turf Management and others.

ARBORICULTURE 01.0501

Organized subject matter and practical experiences concerned with the principles and practices involved in the culture and maintenance of woody plants and trees used for decoration and shade purposes.

FLORICULTURE 01.0502

Organized subject matter and practical experiences concerned with principles and practices of field or greenhouse production of flowers, foliage and related plant materials for ornamental purposes and the arranging, packaging and marketing of these materials.

GREENHOUSE OPERATION AND MANAGEMENT 01.0501

Organized subject matter and practical experiences which are concerned with the principles and practices involved in producing plants under glass and in other modified environments.

LANDSCAPING 01.0504

Organized subject matter and practical experiences which are concerned with the principles and practices involved in locating, planting, and maintaining turf, plants, shrubs, or devices for the beautification of home grounds and other areas of human habitation and recreation.

NURSERY OPERATION AND MANAGEMENT 01.0505

Organized subject matter and practical experiences which are concerned with the production of turf, plants, shrubs, and/or trees for the purpose of transplanting or propagating them.

TURF MANAGEMENT 01.0506

Organized subject matter and practical experiences which are concerned with the principles and practices involved in establishing, managing and maintaining grassed areas for ornamental and/or recreational purposes.

HORTICULTURE, OTHER 01.0599

Include here other organized subject matter and experiences emphasized in horticulture which are not listed above.

RENEWABLE NATURAL RESOURCES 01.06

A combination of subject matter and planned learning experiences involved in the planning related to and improvement of natural resources to include soil, water, air, land (range and artic), fish and wildlife. Included is study of the principles of management and practice of resources mechanics.

CONSERVATION 01.0601

The study of principles and practices involved in maintaining stability and productivity of soil, water, air, land, fish and wildlife.

PROTECTION AND REGULATION 01.0602

The study of the principles and practices involved in the administration of regulations for the protection of renewable natural resources.

OUTDOOR RECREATION 01.0603

The study of recreation as one of the multiple uses of natural resources. Included in instruction are skills in the establishment, maintenance and operation of recreational facilities.

RENEWABLE NATURAL RESOURCES, OTHER 01.0699

Include here other organized subject matter and experiences emphasized in agricultural resources which are not listed above, including emerging occupational areas in this category.

FORESTRY 01.07

A combination of subject matter and learning experiences concerned with the multiple use of forest lands and products, including their production, protection, management, harvest and utilization.

FORESTRY PRODUCTION 01.0701

A combination of subject matter and learning experiences concerned with planting, selection, identification, management and protection of timber and specialty forest crops, such as Christmas trees. Emphasis is also given to maintenance, operation and repair of related equipment and to safety practices.

LOGGING 01.0702

A combination of subject matter and learning experiences concerned with the initial activities involved in harvesting and transporting trees as a crop; maintenance, operation, and repair of logging equipment and machinery; and safety practices related to logging operations.

FOREST PRODUCTS UTILIZATION 01.0703

A combination of subject matter and learning experiences concerned with the many wood products of the forest. Emphasis in instruction is on selection, grading and marketing of forest raw material for multiple uses in conversion to consumer goods. Example: paper, plywood, wallboard, turpentine, plastics, and preservative-treated wood products. Emphasis also is given to maintenance, operation and repair of related equipment and safety practices.

FORESTRY, OTHER 01.0799

Include here other organized subject matter and experiences in forestry which are not listed above.

AGRICULTURE/AGRIBUSINESS, OTHER 01.99

Include here other organized subject matter and experiences emphasized in agriculture/agribusiness which are not listed or classifiable in one of the above categories.